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PIPE LINE INDUSTRY

JANUARY
1961

CONGRESS
SERIAL RECORD
JAN 30 1961

Construction Progress Report

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27,492 Miles to be Laid This Year 22

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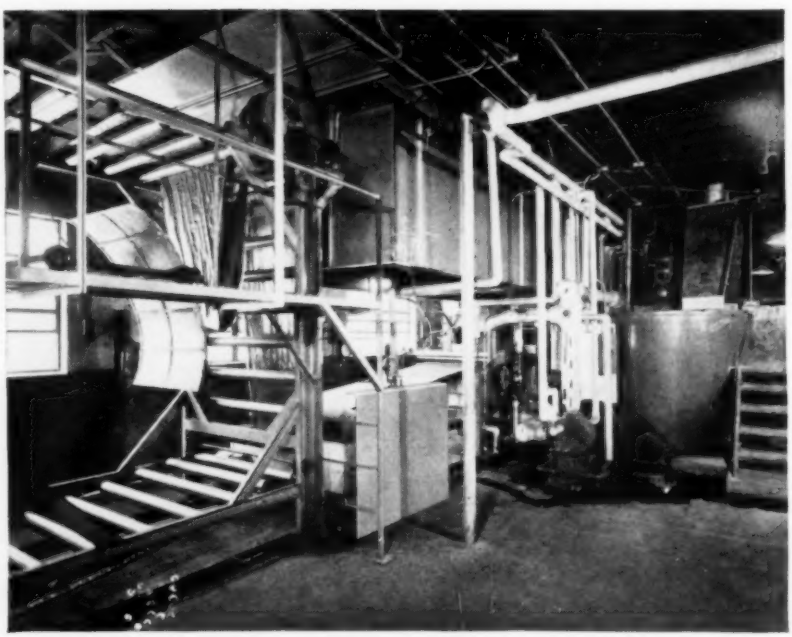

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PIPE LINE INDUSTRY

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January 1961 Vol. 14, No. 1

CONTENTS and Quick Look

To help you put first things first, scan these time-saving digests, checking √ those you want to read first.

CONSTRUCTION PROGRESS REPORT

27,492 Miles of Pipe Line to Be Laid in 1961

☐ PIPE LINE INDUSTRY'S annual survey of 261 companies operating lines in the United States and other Free World countries forecasts another near record year of pipe line construction activity ahead. United States natural gas lines constructed in 1960 totalled 14,028 miles; another good year is expected in 1961, with 13,106 miles planned. Total U.S. construction is estimated at 17,797 miles with LPG work still setting a strong pace. International pipelining continues active, 7,153 miles were reported laid in 1960, and 9,695 miles are planned for 1961 in Free World countries outside U.S.

By Melvin A. Judah and Donald G. DePugh...Page 22

W ys Contractors Saved Money in 1960 Co.astruction

[ ] These ideas improved the quality of pipe line construction to boot. A few of the ideas are old ones ' ich have been refurbished. These many innovations s) ıply reflected the ingenuity of pipeliners.

b Melvin A. Judah and Donald M. Taylor....Page 25

Pi eliners Whip Heavy Surf, Cc ral On Hawaiian Lines

[ ] Two unusual and difficult problems confronted them. First, there was the pounding surf that could exert 600 pounds per lineal foot to displace the lines; and second, there was the rough coral bottom that required blasting and smoothing before the line could be pulled in place. The methods of construction differ considerably from conventional ones in use today.

By Robert L. Bowman and J. H. Bevis.....Page 33

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A Helicopter in Hand?

☐ Seemingly, Freeman Ueckert, Transco's chief inspector on a 30-inch loop job just west of Houston, is holding a toy helicopter as he talks with Houston Contracting Company's spread superintendent Whitey Thompson. But, the "chopper" is anything but a toy. It was hauling 4,000 pounds of 30-inch pipe. At left is Petroleum Helicopter's Sam Hill. At right helicopter pilot, John Sharbrough.

By Donald M. Taylor.....Page 38

How Soviet Gas Industry Is Growing

☐ The Russians are ambitious; Nikita says they will soon outstrip the United States. However, this prospect is not in sight at this time. Russia's seven-year plan calls for about 16,100 miles of additional lines. One of the lines is to be one meter in diameter.

By A. K. Kortunov.....Page 41

Non-Metallic Radio Tower

☐ This tower was made of fiber glass epoxy resin tubing and solves the problem of salt water corrosion. In addition, it is transparent to radio signals and reduces pattern degradation.....Page 44

Jet Turbine Logs 1,300 Hours Service

☐ On the Columbia Gulf system, the 10,500-hp jet engine serves as a heat energy generator producing 14 psi gases at 865° F to drive a two-stage turbine coupled to a centrifugal compressor. Cost of this installation is said to be less than half that of conventional reciprocating engine installations.....Page 45

Complete PLCA Convention program for the Pipe Line Contractors Association annual meeting in San Francisco, January 15-18 .....Page 52

PIPE LINE INDUSTRY published every month. Second class postage paid at Houston, Texas. © Gulf Publishing Company 1961

GUEST EDITORIAL

Contractors Hopeful for a 'Better' 1961

By Jack S. Gray, President
Pipe Line Contractors Association

Jack Gray

IT IS NOT REMARKABLE for pipe line contractors to be looking forward to "a better year." If they were not incurable optimists to begin with, they wouldn't be in the pipe line construction business. Most observers called 1960 an "average to good" year for pipeliners. In 1961, we would like to drop out the "average." What are the prospects?

As usual, a great many of the factors affecting our future are out of our control. Pipe line contractors have to depend upon other industries—primarily the oil and gas industry—to lead out in a building program. No one can afford to go around digging ditches and laying pipe just to keep busy—or as a hopeful promotion.

To that extent we are a satellite industry. We depend not only upon the prosperity of business in general, but upon that of the oil and gas industry in particular. And this great industry has had its special problems of late. Such questions as imports, domestic demand, prices, costs, depletion and depreciation allowances, FPC permits, and all the other eco-political questions that plague oil and gas bear upon the pipe line picture.

In addition to special problems, oil, gas and pipelining have shared the "recession" of late 1960 with the American economy in general. The last half of the year showed a levelling-off in the business cycle that kept most businesses in a watch-and-wait mood. Economists claim it was an inevitable "adjustment period" as industry found itself in a period of relatively stable prices in contrast to the "creeping inflation" of the postwar era.

Several indicators point to an upsurge in the economy. First and foremost is the population explosion, which will inevitably create new demands upon the fuel industries both for domestic and for industrial uses. The nation is committed in several ways to accelerated growth; by necessity from the results of an unprecedented research and development program and by the promises of the successful presidential candidate and his party. To say the very least, a genuine effort will be made in 1961 to arouse the sleeping giant of American industry.

The pipe line industry is merely one of many rapidly becoming aware of the effect of "politics"—meaning governmental action—upon its progress or lack of it. We find ourselves involved in matters beyond our scope—the gold imbalance, regressive tax structures, efforts to control inflation—and more directly in the rising cost of services that is at present the principal factor contributing to the rising cost of living.

The cue for the pipe line industry seems to be: Do the best, most efficient job we can under the circumstances, thus contributing something to the solution rather than to the problem. The better we understand the economic and political factors at the heart of American industry, the better we will be able to gage our actions and our chances in our own restricted field.

A great and growing America simply must continue to offer opportunity to businesses such as ours, for the demand is there and will have to be met if growth is to continue. Whether the confidently predicted upturn will occur early enough in 1961 to make a major impression upon this year's pipe line work is another matter. The cautious approach is to expect another "average to good" 1961 season and hope for a real breakout in 1962.

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reports Ronnie Cook, Project Superintendent for Young and Anderson Co., Brea, California. Behind this enthusiastic statement—performance of a power shift Cat D8 Tractor pioneering a 36-inch pipeline between Newberry and Cucamonga.

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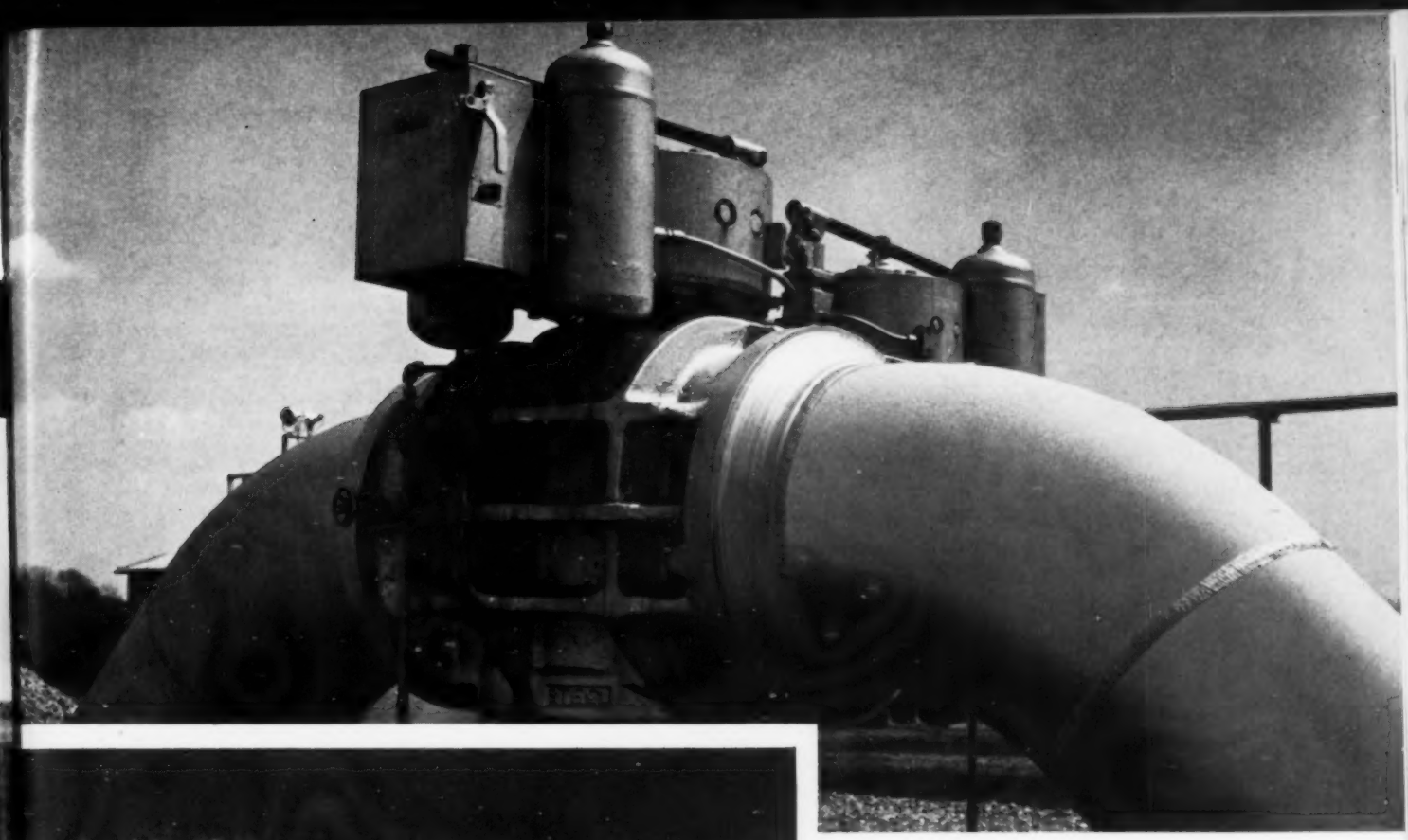

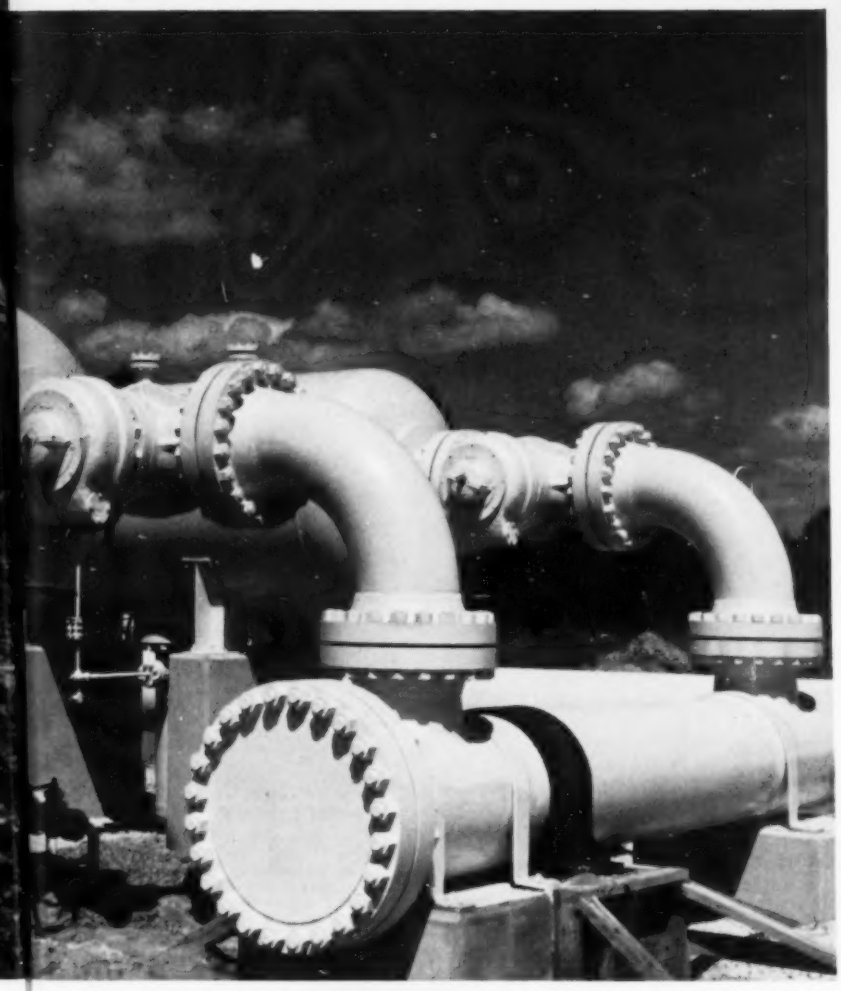

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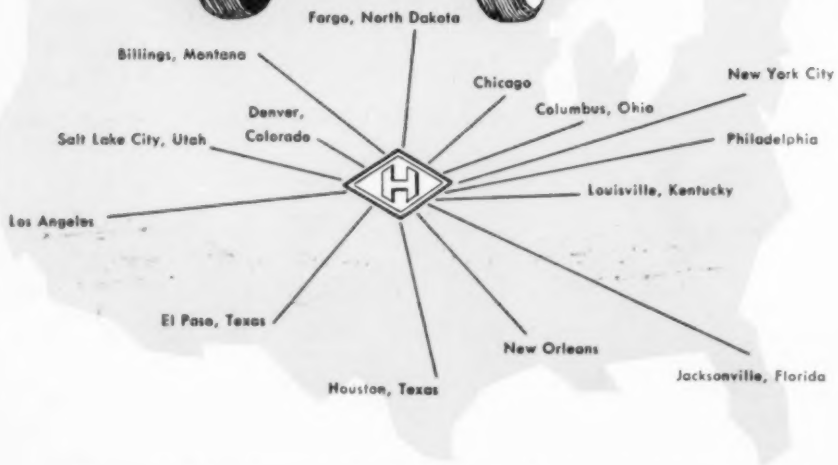

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Indexed by Engineering Index

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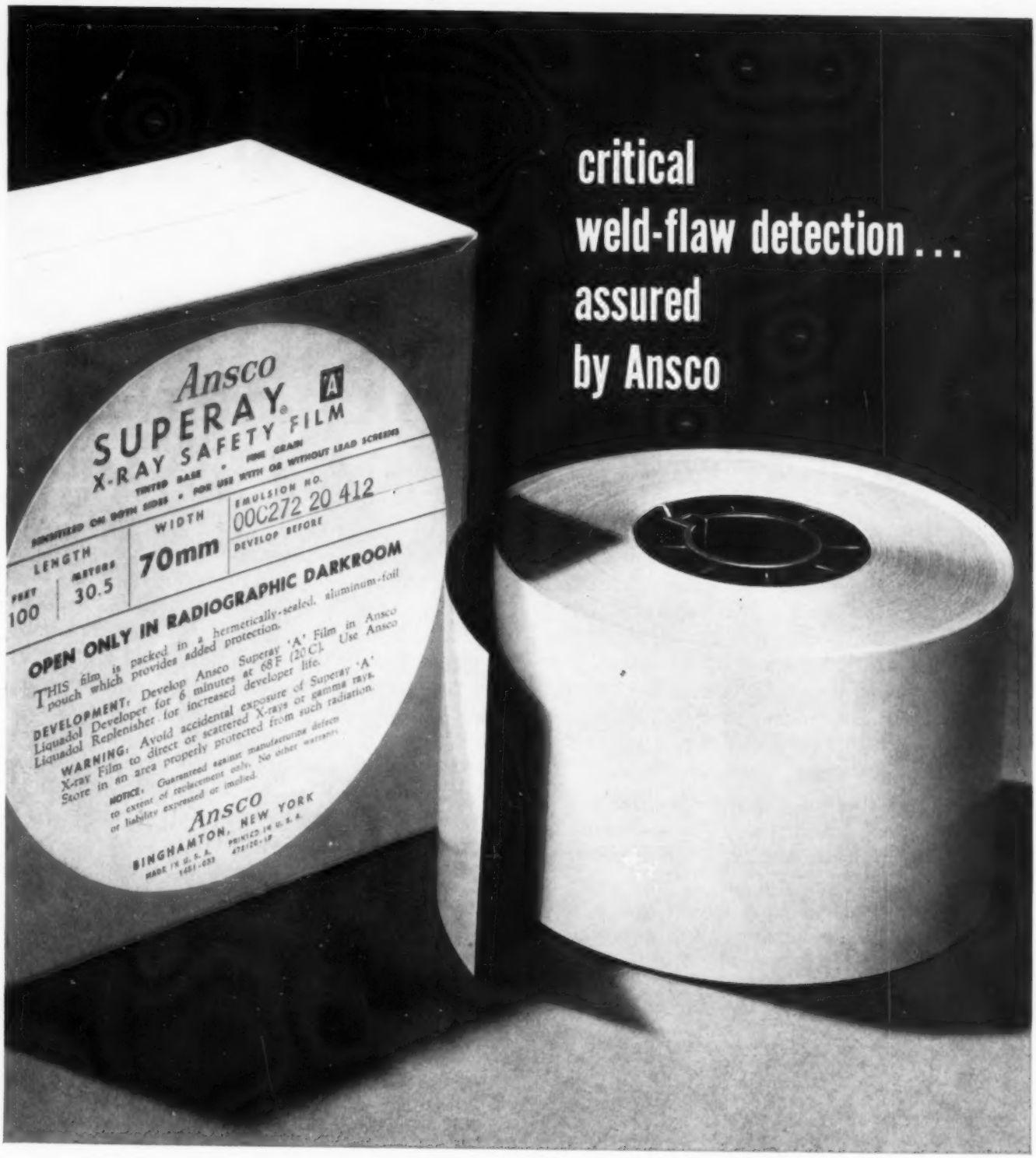
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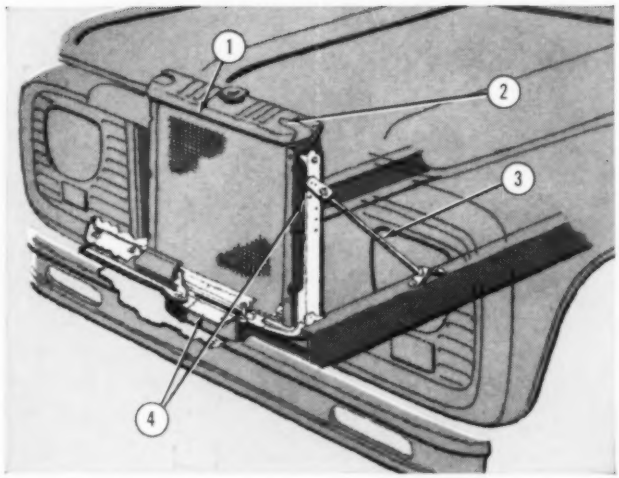

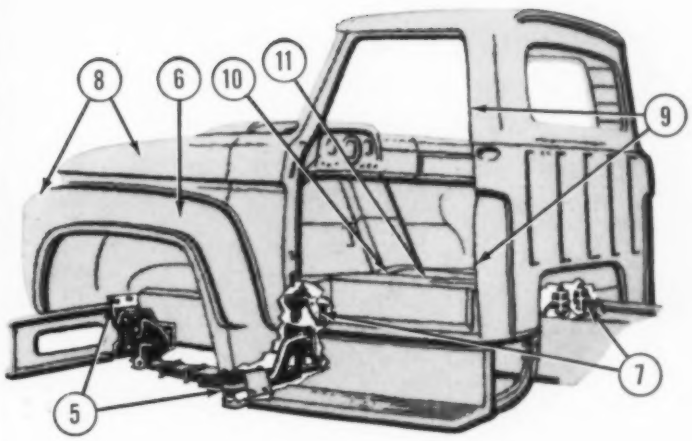

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(4) **Save with "horse collar" mounting** seated on rubber pad for extended radiator life. This new mounting on resilient rubber at the center of frame cross member soaks up any frame flexing . . . cuts wear and tear on entire cooling system.

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(9) **Save with stronger cab construction.** New full-length door pillar reinforcements provide increased cab rigidity, stamina.

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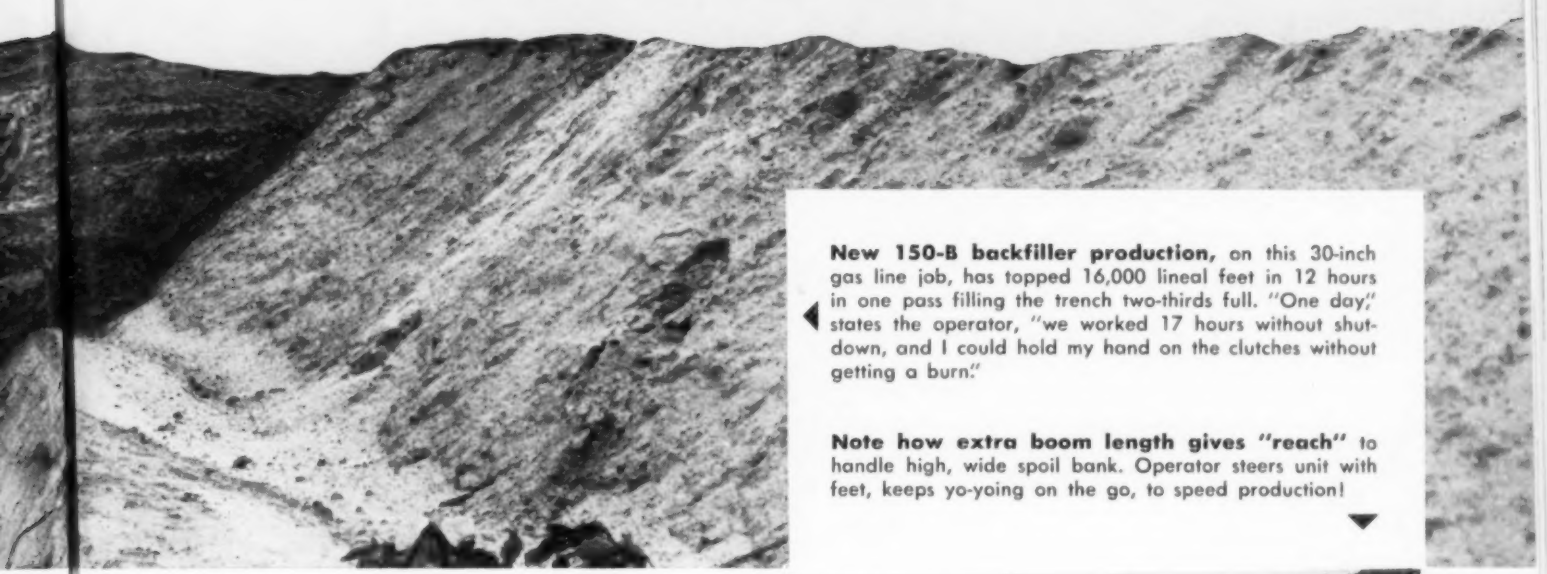

New 150-B backfiller production, on this 30-inch gas line job, has topped 16,000 lineal feet in 12 hours in one pass filling the trench two-thirds full. "One day," states the operator, "we worked 17 hours without shutdown, and I could hold my hand on the clutches without getting a burn."

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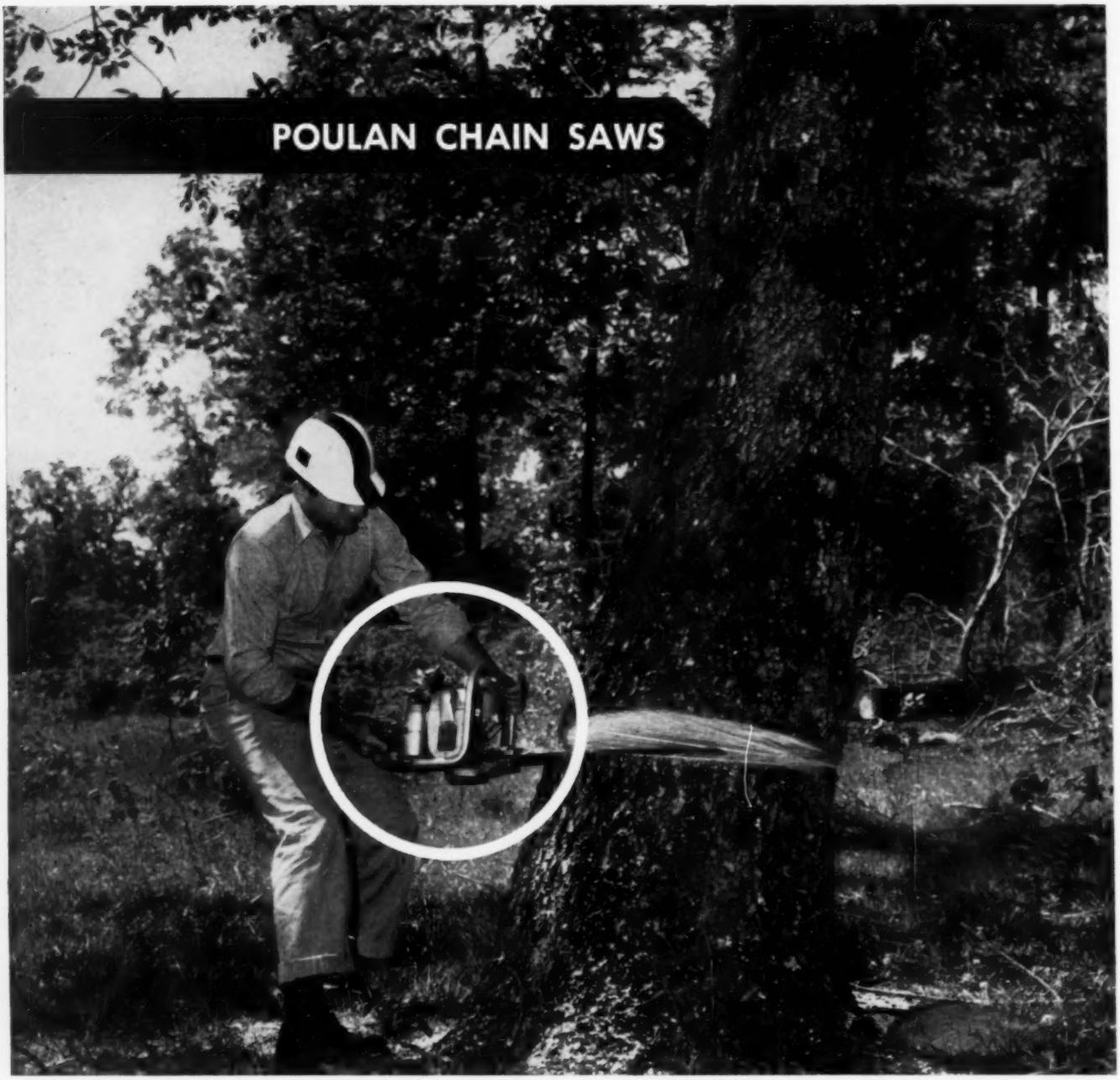

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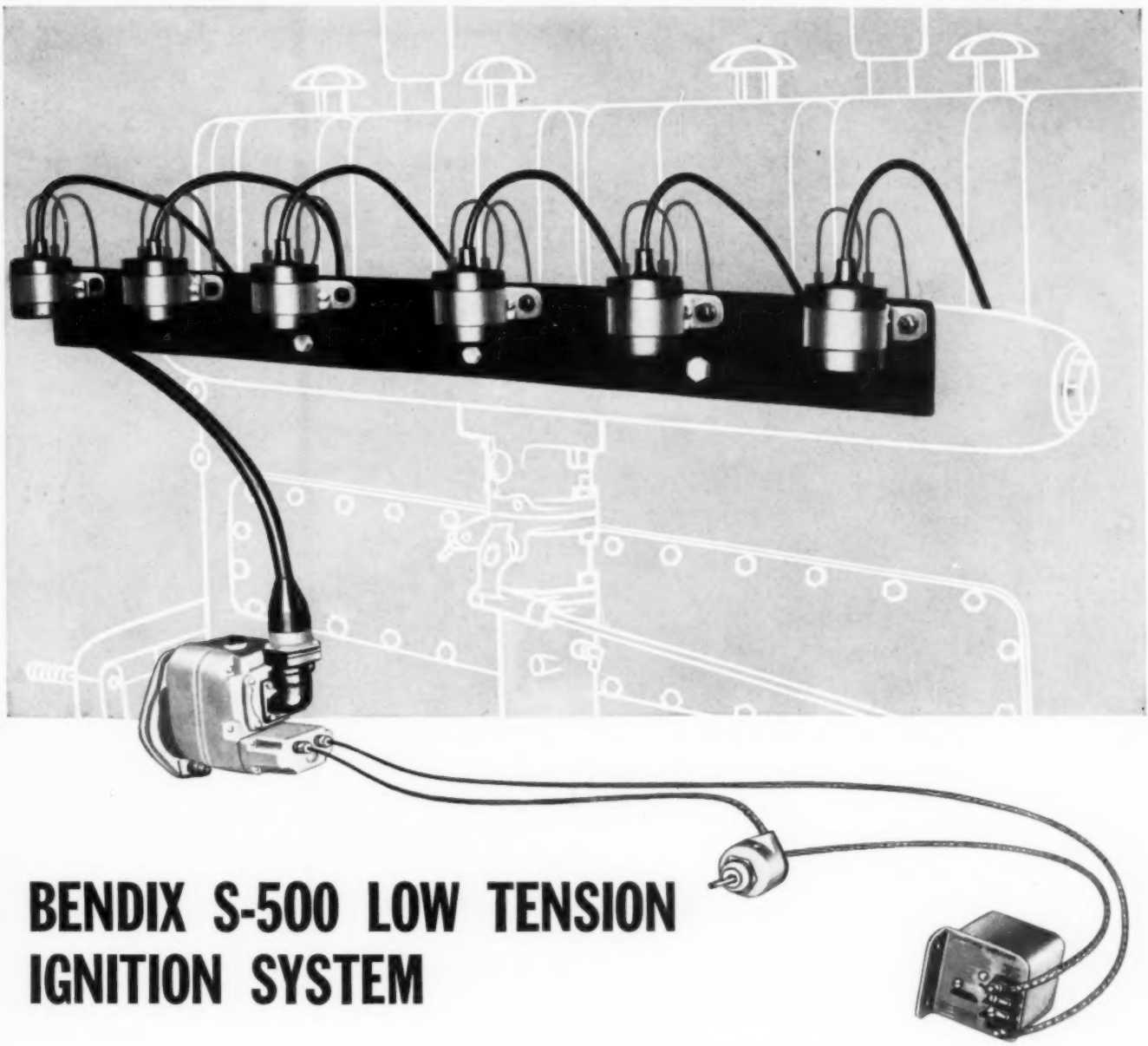

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The S-500 System provides the ultimate in starting and operating efficiency for your four, six, and eight cylinder industrial engines. Specify the new Bendix™ S-500 Low Tension Ignition System. It features "the modern starting concept"—retard breaker magneto and starting vibrator system.

This complete Low Tension Ignition System—including transformer coils, wiring cable assembly, starting vibrator, ignition and starting control switch, and retard breaker magneto—is custom-engineered to assure positive ignition at all cranking speeds and varied retard requirements. It is furnished in base or flange mounting, flameproof and radio shielded, is adaptable for manual or automatically controlled installations.

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The S-500 Series, either base or flange mounted, is supplied with the following features:

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S-502 Super-shielded, adjustable drive assembly.
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New Machine Backfills Ditches At Highest Speed...Lowest Cost

You have to see it to believe it! Here, at last, is a low cost, high-speed backfiller that every contractor will want! The rugged new Vermeer "POW-R DITCH-FILLER" is a tremendous labor and time saver. Now, in just one pass, the big 24" power driven 7½' auger deposits all dirt back in the ditch . . . at a speed you never thought possible! The DITCH-FILLER is a highly maneuverable 4-wheel drive unit with a 36 hp Wisconsin engine and power steering. Hydraulic power provides forward travel speed during backfilling. When in transport the unit is powered with mechanical drive. The new DITCH-FILLER will not only cut your backfill equipment costs, but will also greatly reduce your backfill and cleanup time.

Photo above shows the POW-R DITCH-FILLER starting its run. Ditch shown is approx. 12" wide and 4' deep. Machine is jointed at the center for easy steering, better control and greater ground grip from all 4 wheels.

Here's the completed job. Dirt has been neatly and quickly deposited into the ditch in one pass. Area adjacent is clear of all debris and dirt.

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Please send me complete information, literature and low price of your POW-R DITCH-FILLER. I am interested in seeing a demonstration of the new machine.

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Solar gas turbine stimulates production of oil and gas wells

OIL FRACTURING OPERATIONS – used to stimulate production of oil and gas wells – must take place at the well site. This means that fracturing and acidizing pumping units must be lightweight and mobile – yet provide in excess of 1000 hydraulic horsepower for most operations.

The Western Company's new 1000 hydraulic horsepower fracturing pump is powered by Solar's *Saturn* T-1000 gas turbine engine. Up to 1250 hp is required to drive the pump in this application. Weight of the truck and turbine-driven fracturing unit is significantly less than 500 hp diesel units currently used by Western. The *Saturn* T-1000 turbine-powered pump delivers twice the hydraulic hp of the diesel units – reducing by 50% the number of units needed per operation.

The *Saturn* T-1000 engine weighs only 1200 lbs and occupies less than 51 cubic feet. It is simple in design, starts instantly from –65 degrees F to 130 degrees F, and takes full load in seconds without warmup. It has been engineered for simplicity of operation and long life under industrial conditions. As a compact and reliable power source for generators, compressors, pumps, and other oilfield equipment... investigate the *Saturn* T-1000 gas turbine. There's a Solar gas turbine for almost every application in the 50 to 1250 hp field. Write for particulars to Dept. H-195, Solar Aircraft Company, San Diego, California.

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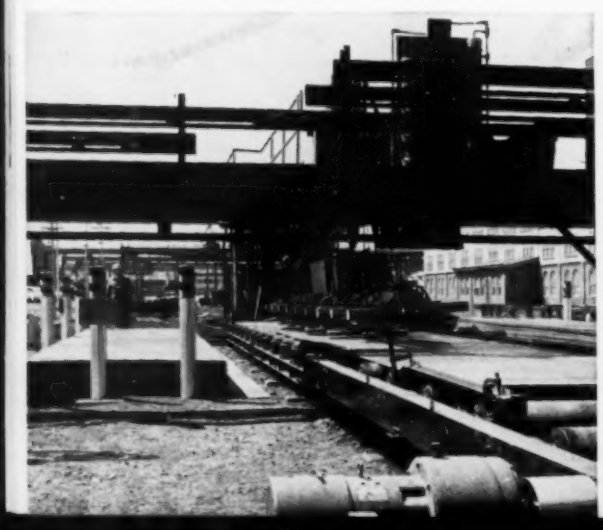
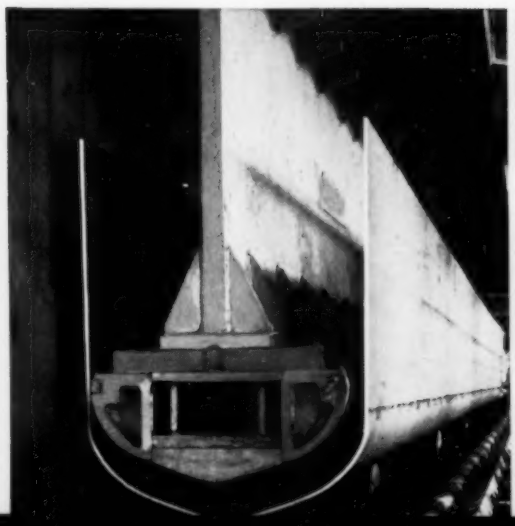
for Strength
. . . Economy
. . . Versatility

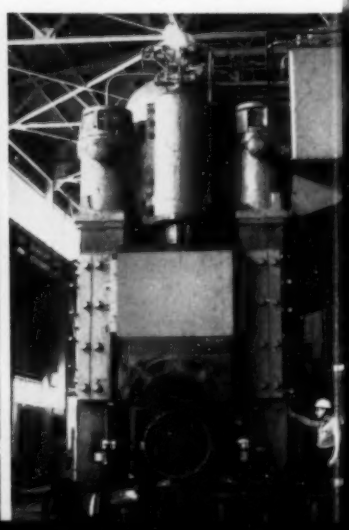
The 40-ft-long plates are handled automatically by this unique one-legged gantry, and delivered to the edge- and end-facing machines.



The prepared plates enter the U-ing press, where they are formed in a matter of seconds. Then . . .



. . . into the 18,000-ton-capacity hydraulic O-ing press. This machine can readily form plate ¾ in. thick.



BETHLEHEM LINE PIPE

Diameters to 42 in. OD . . . walls to 3/4 in.

We're now turning out electric fusion-weld line pipe (18 in. to 42 in. OD) in 40-ft lengths on our new mill at Steelton, Pa. The most modern in the industry, it assures Bethlehem customers of a plentiful supply of pipe meeting API 5LX specifications, as well as non-API pipe in the largest diameters and wall thicknesses presently available anywhere.

The mill's facilities, most of which are equipped with electronic controls, includes newly installed edge and end planers, U-ing and O-ing presses, and welding machines. The only "old" production facilities remaining are the hydraulic pipe expander and the end facer—both installed in 1957.

With this new mill in operation, Bethlehem can meet your most demanding requirements for quality, delivery, and size. The Bethlehem sales office nearest you will give you prompt action on your inquiries.

Line pipe to 16 in. OD made at Sparrows Point, Md.—Our modern electric resistance-weld mill produces API line pipe from 5-9/16 through 16 in. OD, in lengths to 60 ft. We also produce continuous buttweld pipe from 1/2 through 4-1/2 in. OD.

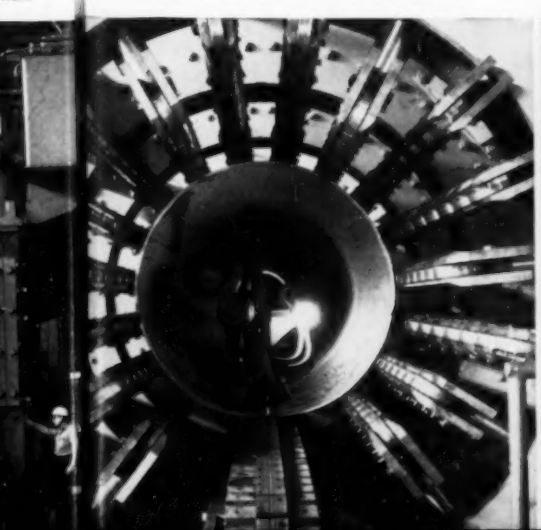
BETHLEHEM STEEL

BETHLEHEM STEEL

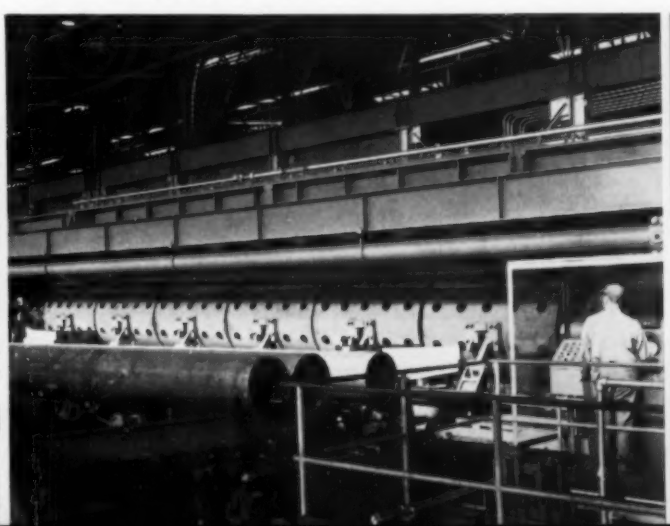
BETHLEHEM STEEL COMPANY, Bethlehem, Pa.

EXPORT SALES: Bethlehem Steel Export Corporation

One of the automatic submerged-arc welding machines making an inside seam. Not shown are the outside welders.



After thorough visual inspection, the 40-ft lengths are fed into the hydraulic expander. It can expand pipe 42 in. OD, with ¾-in. walls.



After fluoroscopic inspection, the pipe is end-faced as shown here. This operation assures the proper bevel for field-welding.

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PIPE LINE PANORAMA

What's Ahead for Pipe Line Construction? . . . PIPE LINE INDUSTRY survey of 191 U.S. and 70 overseas pipe line companies reveals 17,797 miles of domestic and 9,695 miles of overseas pipe lines will be constructed during 1961—almost equalling the all-time mileage high set in 1960, thanks to a significant increase forecast for foreign construction (See Page 22).

Trends in brief:

- **U.S. natural gas lines** . . . 13,106 miles in '61, down 922 miles or 6.6 percent from 1960, but about even with 1959.
- **U.S. products lines, including LPG** . . . 2,887 miles, within 35 miles of record-breaking 1960 total.
- **U.S. crude oil lines** . . . 1,804 miles, up 8.7 percent from 1960, but still far below 1957 and 1958 totals.
- **Foreign construction** . . . will increase 35.7 percent (2,537 miles) over previous high of 7,153 miles constructed during 1960.

Should Casing be Eliminated from Crossings? . . . Use of casing at highway and railroad crossings retards cathodic protection of pipe, thus increasing corrosion factor and reducing safety factor—so states consulting engineer Robert J. Kuhn. Kuhn believes industry would spend money more wisely in many instances by using properly coated carrier pipe made of heavier or greater-strength steel—sans casing. He adds that efforts by state highway commissions and railroads in past decade to require casing at all crossings (See January 1960 PIPE LINE INDUSTRY, Page 31) to increase safety fails to take into account improved pipe strength, weld inspections and other technical advancements which have made need for casing at many crossings a thing of the past.

Booming LPG Demand Boosts Construction . . . Pipe line companies are being pushed hard to keep construction apace with booming LPG demand. Phillips Petroleum reports 10.5 percent increase in sales during 1960 to 9.86 billion gallons —and there appears to be no let up in upward spiral during 1961.

Result: More than 2,300 miles of LPG lines are now in planning stage, including Phillips, Warren, Union Texas and Tuloma's plan to build 1,100-mile line (up to 12 inches) from Houston to North Carolina area, which would parallel Trans Southern's 1,295-mile line now under construction from Mt. Belvieu, near Houston, to Danville, Va. Also planned is Mid America's 405-mile line (10 inches) from Chicago to Superior, Wis., and at least two other shorter lines (See December 1960, PIPE LINE INDUSTRY, Page 51).

Pipe Line Briefs . . . Texas Eastern's B. D. Goodrich predicts slowdown in growth of natural gas sales during next 20 years, i.e., commercial and residential sales will increase about 7 percent annually for next decade, then drop to 4 percent over next 10 years; increases in industrial use will drop from present 7 percent to 4 percent during next decade, then to 2½-3 percent for second decade; however, by 1980, natural gas sales are expected to be accounting for one-third of energy market, compared with 26.5 percent today . . . **Pipe line companies,** including Lone Star Gas and Service Pipe Line, are following oil company 5 percent wage increase pattern . . . **E. Clyde McGraw, Transco's president,** calls for united industry watch on two stated objectives of Kennedy administration: Reduction or abolition of depletion provision and proposed national fuels policy . . . **House Legislative Oversight Subcommittee** has recommended legislation removing utility-like controls from natural gas producers; meanwhile, industry unity on a natural gas bill can be expected shortly.

27,492 Miles of Pipe Line To Be Laid in 1961

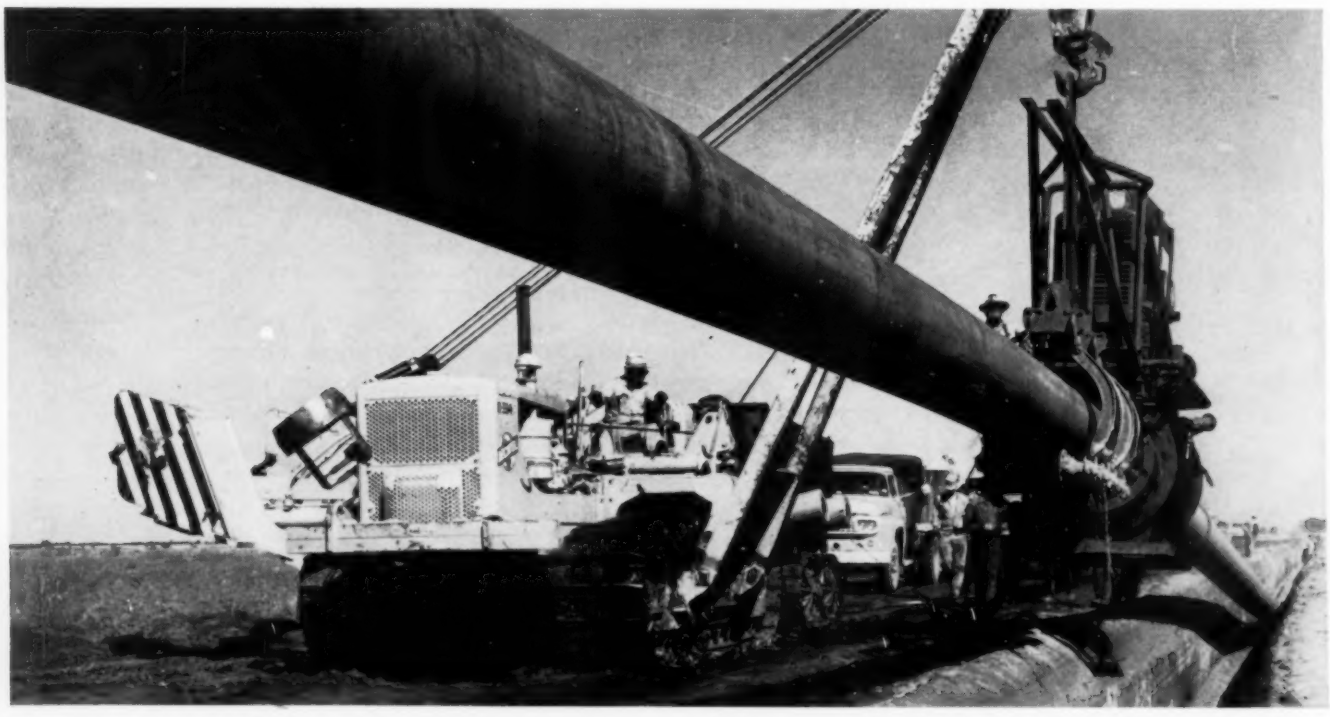
- Gas pipe line work to continue at near record pace
- Products lines (boosted by new LPG systems) to repeat brisk year
- Crude oil line work to be only slightly above slow 1960

By Melvin A. Judah, Editor
and Donald G. De Pugh, Construction Editor
PIPE LINE INDUSTRY

PERHAPS PIPE LINE forecasting falls in about the same order of predictability as the Texas weather, a woman's mind and politics. Sometimes we think so.

Traditionally, the total mileage of pipe line construction work planned by the operating companies surveyed (and forecasted by our editorial summary) is on the high side. Last year's annual survey showed 2 percent less U.S. pipe line construction mileage completed than had been forecast at the beginning of 1959. That is close to par.

But this year's survey is the first ever conducted by PIPE LINE INDUSTRY which showed that a greater mileage of U.S. pipe lines were constructed during the year than had been forecast in January of that year; in 1960 a total of 18,610 miles of lines was laid in the U.S. according to the survey of 191 pipe line companies. Most of this increase over estimates came about because of the boost in products line construction; and the major portion of that was for LPG lines. Thus, there had been 5 percent more pipe line construction than had been predicted at the year's beginning. And we thought we were somewhat optimistic in last year's forecast.



One major project in 1960 was Midwestern Gas Transmission's 504-mile, 24-inch line from Canadian border to Marshfield, Wis. On its northern Minnesota spread, Bechtel Corp. applies hot wax, polyvinyl wrap and an outer wrap of kraft paper.

Forecast of Free World Pipe Line Construction for 1961

	UNITED STATES		FREE WORLD OUTSIDE U.S.		TOTAL FREE WORLD	
	1960	1961	1960	1961	1960	1961
NATURAL GAS LINES:						
Transmission Lines	10,528	9,806	2,467	3,230	12,995	13,036
Gathering Lines	3,500	3,300	1,020	1,195	4,520	4,495
Total Gas Lines	**14,028**	**13,106**	**3,487**	**4,425**	**17,515**	**17,531**
CRUDE OIL LINES:						
Trunk Lines	610	657	1,994	2,370	2,604	3,027
Gathering Lines	1,050	1,147	950	1,060	2,000	2,207
Total Crude Lines	**1,660**	**1,804**	**2,944**	**3,430**	**4,604**	**5,234**
PRODUCT LINES: (Including LPG):						
Total Lines Main and Laterals	**2,922**	**2,887**	**722**	**1,840**	**3,644**	**4,727**
TOTAL ALL LINES	**18,610**	**17,797**	**7,153**	**9,695**	**25,763**	**27,492**

Forecast of Station Horsepower Installed by Free World Pipe Line Companies

	UNITED STATES		FREE WORLD OUTSIDE U.S.		TOTAL FREE WORLD	
	1960	1961	1960	1961	1960	1961
COMPRESSOR DRIVES:						
Gas Engines	345,800	407,652	69,580	74,470	415,380	482,122
Gas Turbines	25,000	36,400	53,685	35,370	78,685	71,770
Electric Motors	32,000	29,000	.....	.....	32,000	29,000
Total Compressors	**402,800**	**473,052**	**123,265**	**109,840**	**526,065**	**582,892**
PUMP DRIVES:						
Electric Motor	66,050	32,545	33,275	33,760	99,325	66,305
Gas and Diesel Engines and Gas Turbines	10,629	10,020	20,725	67,300	31,354	77,320
Total Pumps	**76,679**	**42,565**	**54,000**	**101,060**	**130,679**	**143,625**
GRAND TOTAL	**479,479**	**515,617**	**177,265**	**210,900**	**656,744**	**726,517**

PLCA President Jack S. Gray states in his guest editorial this month that 1960 was an "average to good" year. Although the total mileage was at a record level, a good amount of this was of smaller diameter lines which would take off some of the bloom for the contractors.

With this background, here is how the forecast for 1961 shapes up from a survey of all major pipe line operating companies . . . 191 U.S. firms and 70 Free World operators outside of the U.S. While the total mileage of planned U.S. construction, 17,797 miles is not a record forecast, neither is it far behind the 18,610 miles completed last year. Again, the proposed gas pipe line construction work of 13,106 miles makes up the major portion and a lot of this will be big-inch pipe. Gas pipe line companies also plan additions of 473,052 horsepower using various type prime movers. This level of station construction is somewhat above 1960, and at about the same level as in earlier years.

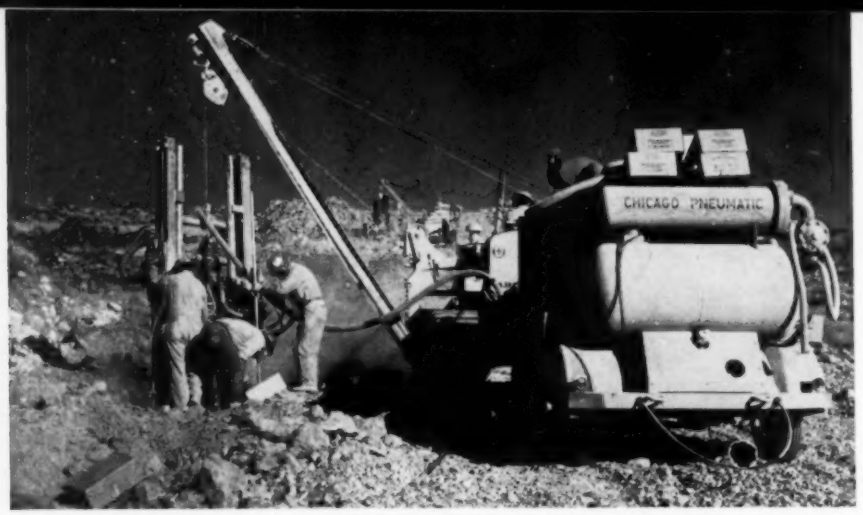
While there are no Memphis Decision stumbling blocks in the gas pipe line growth plans, there are a few unknowns down the road just ahead; a change in administration including the critical Landis report on federal regulatory bodies and of President-Elect Kennedy's concern in that area; the appointment of new FPC Commissioners, etc. And the gas industry may have some growing pains with the new area pricing approach of the FPC, as well as possible headaches from a National Fuels Policy study. On economics, it may be a few months into 1961 before the pictures of the general economy and the oil and gas industry specifically are clarified.

But on the plus side are the growing energy demands of the country (and indeed the entire World), the engineering advantages of pipe line transportation, plus the tech-

Forecast of Diameters Used in Construction Projects

Nominal Diameter (Inches)	U.S.		OUTSIDE U.S.	
	1960	1961	1960	1961
2–4	3,444	2,084	751	749
6	1,993	1,345	613	590
8	1,609	1,475	633	803
10	1,422	1,329	477	661
12	1,063	1,279	920	832
14	253	180	213	324
16	1,005	941	1,033	419
18	311	262	260	760
20	803	729	359	286
22	29	40	....	79
24	2,292	992	1,139	150
26	134	185	....	....
28	....	....	....	70
30	1,858	937	267	1,806
32	....	....	70	42
34	147	650	60	286
36	266	1,751	....	332

Total of all diameters not equal to industry total, as some reporting companies did not show breakdown by pipe diameter.



Transwestern had plenty of rocky right-of-way; here, H. C. Price Company used twin air drills to speed blasting in rugged country near Kingman, Ariz., on Transwestern Pipeline Company's 1,800-mile system. One spread encountered 18 to 20 percent rock which required some blasting.

nical competence of the industry and of the contractors who build new pipe lines. If the political and economic factors are even "only slightly favorable" it should turn out to be another good year.

Products Lines Grow . . . LPG Leads Way. In 1960, new products pipe line work exceeded that of crude oil lines for the first time in PIPE LINE INDUSTRY construction surveys. Work on the 2,170 mile LPG system of Mid-America Pipe Line Company was the main reason for this jump; and the 2,887 miles of products pipe line mileage forecast for 1961 is again largely the result of planned LPG systems. Total crude pipe line mileage proposed for 1961 is up slightly from last year's 1,660 total to 1,804 miles.

Largely the result of the increase in products pipe line mileage, 1960 pump station additions in the U.S. were considerably above year ago forecast with a total of 76,679 horsepower. Pump station installations proposed for 1961 are 42,565 horsepower.

Free World Pipe Lines Continue Growth. For the several years that PIPE LINE INDUSTRY has surveyed those international pipe line companies outside of the U.S. there has been a steady rate of growth averaging almost 1,000 miles a year. For 1960, 70 of these operators reported a total of 7,153 miles completed. Crude oil lines made up almost one-half of this total with 2,944 miles laid; gas pipe line construction totalled 3,487 miles in 1960, with 4,425 miles of gas pipe lines forecast for 1961. Products pipe line construction in these Free World countries amounted to 722 miles in 1960; for 1961 a total of 1,840 miles of products pipe line work is forecast. Bulk of the total 9,695 miles of construction forecast for 1961 by these operators is scheduled for Canada, Mexico, Europe, North Africa and South America.

Stations additions on these Free World systems are scheduled for increases, too. A total of 210,900 horsepower of all types is proposed for 1961; additions totalling 177,265 were made on these 70 pipe line systems in 1960.

Survey Was Comprehensive . . . 261 Companies Covered. Construction figures and forecasts in the accompanying tables are based on PIPE LINE INDUSTRY's survey of all major pipe line companies operating in the U.S. and other countries this side of the Iron Curtain. Survey forms asked for mileage of line completed in 1960 and planned for 1961 construction by class of service; they

Mid-America Pipeline Company's 2,170-mile, 4-10-inch LPG system from Eunice, N. M., to Minneapolis and Madison was completed at a record pace in 1960. Photo shows Secrest Pipe Coating Company applying coal tar, glass inner and outer wrap protection. Rate of progress on this Williams Brothers spread reached 38,800 feet of 8-inch in one day.

provided for a breakdown of mileage by diameter for each service, and for station horsepower additions by type of prime mover driving compressors or pumps. The 191 companies who operate virtually all of the pipe line system mileage in the U.S. and 70 leading companies operating pipe lines in other Free World countries were included in the reported data. Results of the survey are very complete; virtually every company reported. They told PIPE LINE INDUSTRY editors how many miles of line they laid in 1960, gave diameter breakdowns and station additions installed last year and reported plans for 1961. Tabulated data also includes estimates from a few companies who did not report, but who had previously made public announcement of project completions or future plans. Survey data does not include gas distribution lines laid within cities, field flow lines, conversion of lines from one service to another or reconditioning work.

Reports reflect work actually done in 1960 or planned for 1961. They do not cover total additions placed in service in 1960 part of which may have been started earlier nor total mileage of projects being started in 1961, some of which may not be completed until 1962 or later. In this way an attempt is made to include in each year's report that pipe line and station construction activity actually carried out in that year.

Some of the Ways Contractors Saved Money in 1960

Most of these ideas are new, but some of them are old ideas that have been refurbished

By Melvin A. Judah, Editor
and Donald M. Taylor, Engineering Editor
PIPE LINE INDUSTRY

FOR THE PAST six years PIPE LINE INDUSTRY has published each January a compilation of new construction ideas developed during the preceding year. This year the approach has been altered slightly to include improved developments—some of which have not come suddenly and a few not necessarily brand new.

One such idea is the use of a heavy ripper instead of explosives for ditching through certain types of rock. The savings to the contractor have been important in certain areas. The ripper is by no means a new development, but its use has been advanced greatly.

Pipe line contractors continue to hold a fairly firm line on their bids. Bid prices have risen no more than 10 to 15 percent in the past 10 years despite increasing labor and equipment costs. In effect, this has meant a gradual reduction in laying costs. Two factors have made this possible. First is improved efficiency of equipment. For example, tractors are bigger today and can accomplish more. The second factor is the natural ingenuity of contractors and pipeliners. They continue to find better ways of doing things.

Most of these ideas originated with pipeliners, although a number have been marketed by manufacturers.

Ripper Slashes Cost of Ditching Through Rock

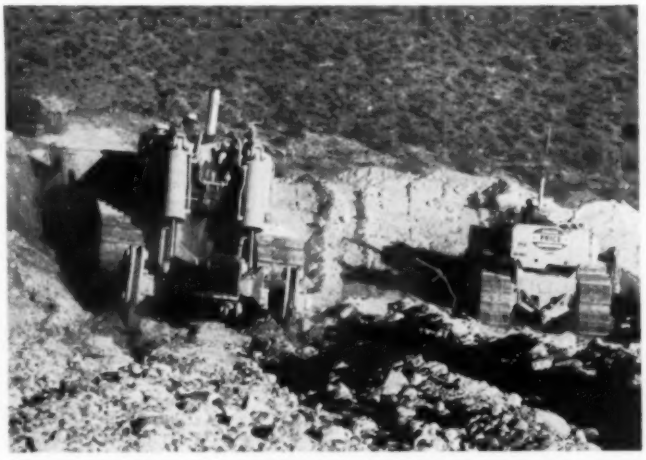
One of the most efficient mechanical devices of our times is the use of a heavy-duty tractor to pull a ripper through rock which will yield to this method of breaking. Almost every ounce of weight and virtually all available horsepower of the tractor is used in performing this highly profitable task.

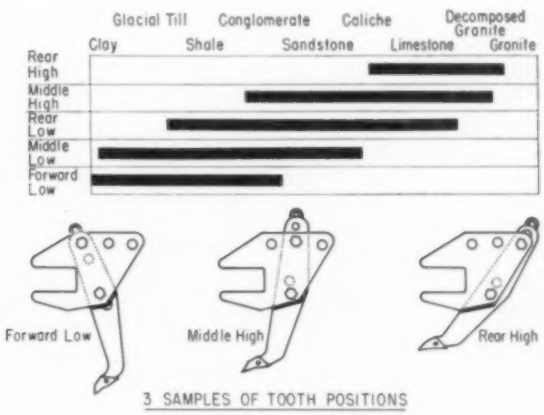
The cost of ripping rock with a tractor is a fraction of the cost of uncovering the rock, drilling and shooting. Where the rock can be ripped, one tractor operator can do in hours the job that would take days for crews of men to accomplish with assorted equipment and high explosives.

Not all rock can be ripped. And drilling and shooting rock is by no means a lost art. But where the ripper can be used, the contractor can effect big savings.

The ripper must be equipped with proper size and type of tip to be most effective. The angle of the tooth is also very important. The accompanying chart gives proper angle and setting for various types of rock.

The tractor shown in the photograph is ripping rock on one of H. C. Price's spreads working on Transwestern Pipeline Company's line through a rugged section of Arizona. Houston Contracting Company used this technique extensively in New Mexico as did the joint-venture firm of Pacific Pipeline Construction Company and Engineers Limited Pipeline Co. in California.





3 SAMPLES OF TOOTH POSITIONS

Drawing courtesy Caterpillar Tractor Company

Sheepsfoot Roller Compacts Road-Crossing Backfill

Narrow sheepsfoot rollers pulled in tandem down a road-crossing ditch can compact the backfill sufficiently to satisfy the most strict inspection requirements.

Shown here is a roller assembly designed and fabricated by Houston Natural Gas Corporation pipeliners and endorsed by a number of Texas Highway Department inspectors who in the past had difficulties getting the degree of compaction required for highway construction. The two rollers are made from 24-inch pipe, sealed on each end with half-inch plate and mounted on truck axles. Forty-nine sheepsfeet were welded to each drum and 850 pounds of metal shot was added to each drum for weight. The frame assembly is made as shown. The bridle makes it unnecessary for the tractor to straddle the ditch.

(For additional information see June 1960 PIPE LINE INDUSTRY, Page 44.)

Helicopters String Pipe in Difficult Areas

It cost about $300 per hour to rent a helicopter and crew capable of stringing big-inch pipe, but there are times when this cost is more than justified.

Last Spring, stringing contractor, J. O. (Red) Willett Pipe Line Stringing Corporation and Sharman, Allen, Gay & Taylor, Inc., used helicopters to string 2.3 miles of 24-inch pipe in the Trinity River bottoms of Texas for Trunkline Gas Company. The cost was about 80 cents per foot. (See PIPE LINE INDUSTRY, June 1960, Page 36.)

Willett and Houston Contracting Company used a helicopter on Transcontinental Gas Pipe Line Corporation's job near Houston. The cost was $6,000 for stringing 17,776 feet of 30-inch. (See Page 38.)

Both jobs paid off under these conditions because it was virtually impossible to string by any less expensive method.

Improvements in Ditch and Pipe Padding

Huge 21-cubic-yard bottom-loading earth movers have improved ditch and pipe padding with rock-free material. Houston Contracting used eight bottom loaders on one Transwestern job spread in New Mexico. A side auger supplied the 4 inches of ditch padding and a 4-cubic-yard front-end loader padded around the pipe. The most important aspect of the padding operation is finding rock-free soil near the right of way. Rotary-type backfill sifters were used on some spreads. They performed best on 20-inch and smaller diameter lines.

Tow Tractor Makes Ditching Machine Cut Faster

Where cutting ability of a ditcher is important, a tow tractor may pay off—even in level country. Houston Contracting Company kept a tractor ahead of the ditcher on the Transwestern Pipeline Company job in New Mexico. With a tight tow line, virtually all the power of the ditcher went into the wheel. The machine could bite into the earth better and progress was faster. Ditching machine maintenance and downtime was less. The added footage more than made up for the cost of the tow tractor. (See PIPE LINE INDUSTRY, August 1960, Page 25.)

Roller Added to "Lizard" Makes It More Effective in Protecting Pipe

H. C. Price Company used a "lizard" on one job. The innovation on this lizard is a rubber roller that protects the coating from the lizard itself. The lizard keeps rocks from crashing into the coating during backfill. It works rocks away from the pipe as it is pulled ahead from beneath the backfill.

The lizard is applicable only where the percentage of rock in the backfill is relatively low.

Shop-Modified Tractor Supplies Current for Four Welders from Two Machines

Houston Contracting Company modified this tractor for pipe gangs. Two 300-amp, 40-volt welding machines are driven directly from power take-offs from the 105-hp tractor diesel engine. Four 300-amp welding leads supply ample current for four stringer bead welders.

One of the features contributing most to the efficiency of the welding tractor is a 2 percent speed control governor to provide precise current control. A constant output is thus supplied, with each welder adding about 20-hp load onto the engine during actual welding. The load runs 40-hp when a dead short is struck. A 2-cfm air compressor is V-belt driven off one of the welding units to supply air for the pneumatic line-up clamps. Summed up, the ideas can mean more efficient use of tractor power.

Four (or Even Six) Firing Line Machines Mounted on Tractor

H. C. Price Company mounted four—or even six—300-amp welding machines on a tractor to speed work through the rugged terrain of Arizona. Speed and mobility were added to the firing line welding. Note the air compressor for powering pneumatic grinding and chipping tools.

On eastern Transwestern spreads, Houston Contracting Company converted to diesel engine-driven welding machines on the firing line. This simplified fueling chores and paid off in economy at the same time.

Portable Shelters for Welders Pay Off

Houston Contracting Company has used portable shelters to protect welders from cold during winter months. These shelters contributed to progress on the Transwestern job in New Mexico by permitting work to continue despite wintry winds that sometimes reached 18 to 20 mph.

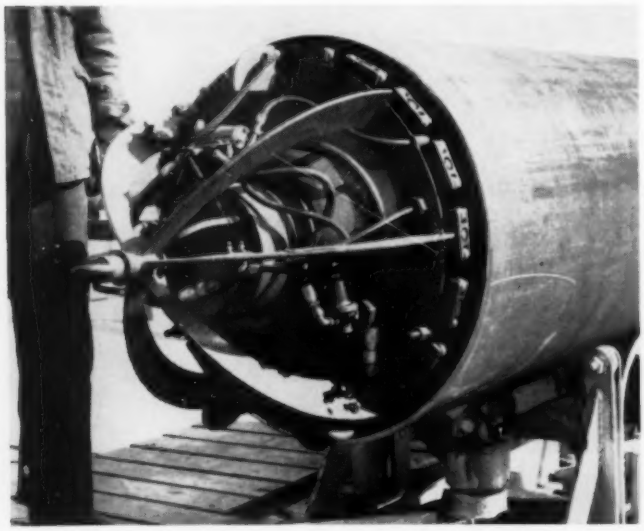
Cleaning the Inside of Coated Pipe Ahead of the Pipe Gang

Time was when mud, sticks, rocks and welding rod inside pipe lines meant little one way or another. But where the inside of the pipe is coated with epoxy resin, the removal of foreign material by pigging can cause considerable damage. Or if a coated line has to be pigged thoroughly with hard brushes before it goes in operation, this takes a toll on the internal coating. It now makes good sense to keep the inside of the pipe clean. On this Contracting & Material Co. spread on the Midwestern Gas Transmission job, each joint was blown out with compressed air before the arrival of the pipe gang. And a careful watch was maintained during remainder of construction to insure that the pipe was kept clean.

Rollers Improve Line-up Clamps

New line-up clamps that press rollers outward against the pipe, thus allowing the metal to equalize the rounding-out pressure of the clamps, are proving highly effective in taking the "egg" out of the pipe. This addition of rollers is a simple thing, yet it amounts to a major breakthrough for pipe line work.

Machine beveling is also improving, and this too can reduce the number of high-lows which confront the pipe gangs. Thanks to these innovations, girth welds are now superior to those of a few years back.

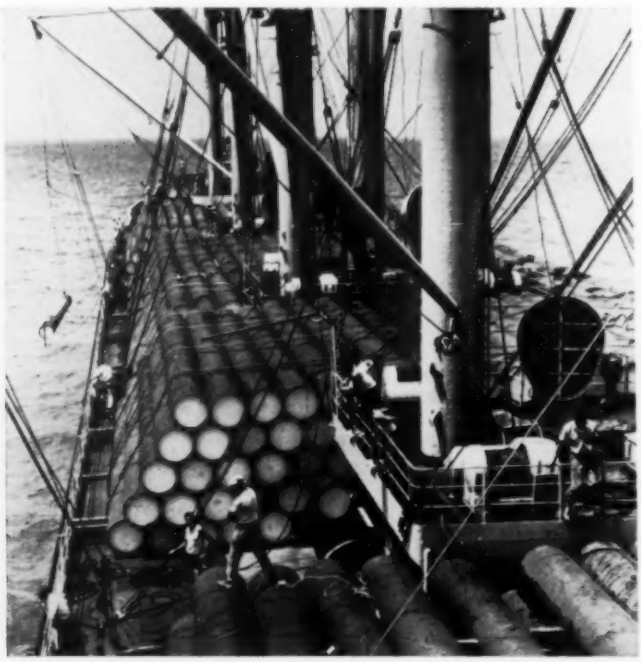


Burner Pre-heats X-56 Pipe

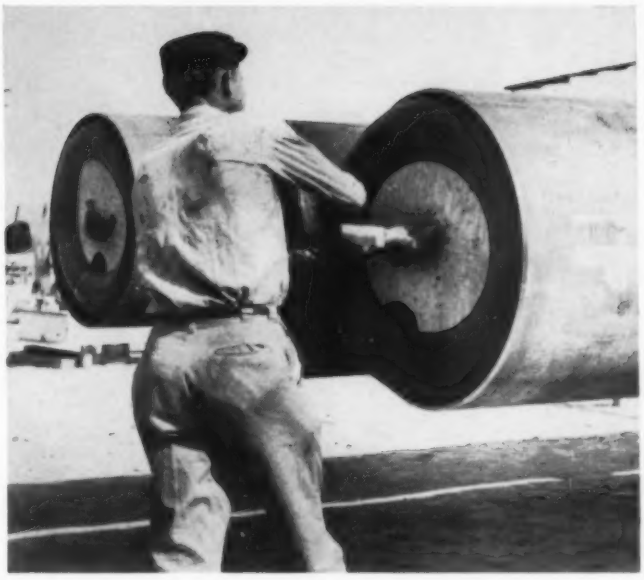
The high carbon and maganese content of X-56 pipe limits its weldability so far as temperature is concerned. The propane burner shown here was used on the Transwestern job to heat the pipe in the weld area to about 320° F. Chill was taken out of the pipe for a distance of about 2½ feet from the end. Normally this pre-heating was carried out 2-3 joints ahead of the pipe gang, and at the time of line-up and stringer bead its temperature was probably below 300° F. The minimum specified at the time the stringer bead was run was 150° F.

Floating Pipe Ashore

Esso Standard (Libya) Inc. stopped up the ends of 40-foot joints of 30-inch pipe, lowered them into the Mediterranean and floated them ashore at Marsa El Brega on the Gulf of Sirte, Libya. The photographs show one of the 40-foot joints being lowered into the water and then being snaked ashore after being towed in by motorboat. The pipe was loaded onto trucks and strung out on the line. The plastic plug remained in place until the pipe was ready for welding. The economy of this bit of pipe line ingenuity is downright amazing.



Preventing Cold Air From Chilling Welds at Double-Jointing Yard



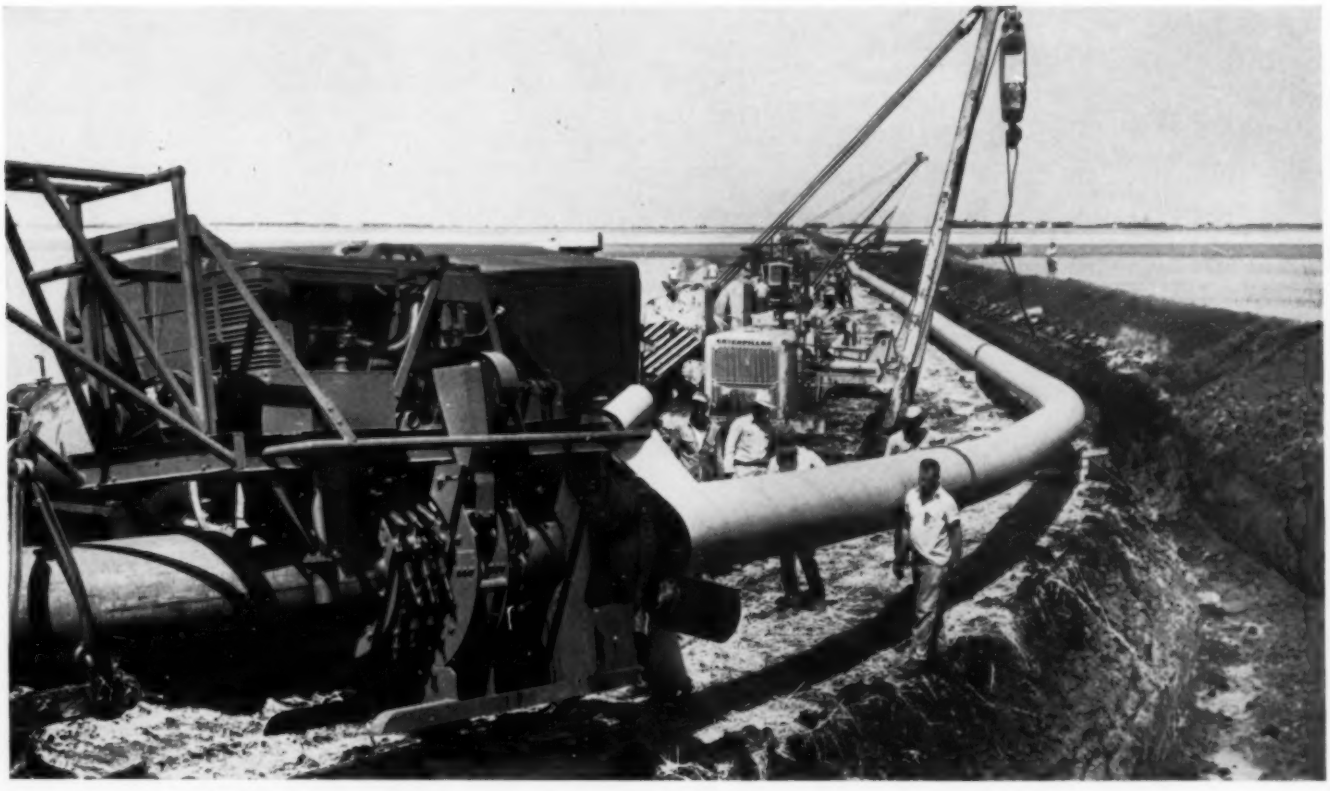
Inner tubes mounted on plywood discs proved effective in slowing the cooling of double-jointing welds made on X-52 pipe at the Pacific Lighting Gas Supply job in California. By inserting these inflated stoppers in the outside ends of the two 40-foot joints prior to preheating the ends to be welded, Pacific Pipeline Construction Company prevented cold air from circulating inside the pipe to slow cooling of the hot weld ends.

The value of an arrangement such as this depends on the weldability of the pipe and the ambient temperatures encountered. However, from the practical standpoint, it is better to cool too slowly than too fast.

Tape Contributes to High-Speed Pipelining

Bechtel Corporation laid 155 miles of 24-inch pipe line for Midwestern Gas Transmission Company in just 27 days with two spreads. Each spread averaged from 17,000 to 18,000 feet of completed line per working day. The job kicked off on July 20 and was completed August 15. Final cleanup was completed 10 days later on these sections. Included in the 155 miles was 101 crossings—92 under roads and 9 under railroad tracks. These required about 9,400 feet of casings.

One of the techniques that helped to set this construction pace was the application simplicity of the coating systems. Bechtel's Spread No. 1 used a new laminate tape and Spread No. 2 used this butyl-rubber, polyvinyl system on over half of its mileage. The applied butyl-polyvinyl tape system was 20 mils thick; pipe was cleaned, the butyl rubber primer, tape, and laminated 40-50-40 kraft were applied in one operation with one machine. Remainder of the northern Midwestern line is protected with 151 miles of modified coal tar, 70-miles of high temperature coal tar, 118 miles of microcrystalline wax with plastic wrap, and another 31 miles of butyl-polyvinyl systems.



Fork Lift Truck Speeds Stringing

This rubber-tired fork lift truck, specially equipped for pipe line stringing, proved highly effective in handling the 80-foot length of pipe on Pacific Lighting Gas Supply Company's line laid through desert terrain. The stringing contractor (Contractors Cargo Company) used trailers with rubber-padded racks to haul the pipe to the right of way. There the fork lift trucks, equipped with special rubber padding inside the hydraulic clamp, removed it from the truck and placed it at proper point on right of way. This is a step toward better pipe handling.

New Type Gaskets May Mean More Flanged Valves

There has been a trend in recent years toward weld-end valves for pipe line service, but a new gasket seal that uses two "O" rings may make flanged valves more attractive, particularly for products service. This seal design provides metal-to-metal surface contact between flange and gaskets plus a "double-O" ring seal on each side. These gaskets have been tested out for bubble tight seal in LPG service at pressures in excess of 4,800 psig. Here workmen are installing these gaskets at one of the new Mid-America Pipeline Company stations during construction of that system.

Trucking Liquid Coal Tar

One of the innovations to come from the Pacific Lighting Gas Supply Company job in California was the trucking of hot liquid coal tar for 125 miles. In this case it was delivered to the coating yard at Minneola from a coke plant in Fontana, Calif. It was loaded at 525° to 550° F and during transit it cooled about 6 degrees per hour. Special agitators kept the filler etc. in suspension. The tank trucks could deliver 52 tons per trip. PLGS engineers predict that this method may be practical for even longer hauls. —**The End**

The first of eight 1,400-foot sections of 30-inch pipe starts into the Pacific Ocean. Each section rolls into the water on rail-mounted dollies which fall into a pit from beneath the pipe. A crane is lifting one out of the water for re-use.

Pipeliners Whip Heavy Surf and Coral to Lay Offshore Hawaiian Lines

The 20 and 30-inch lines had to be laid 45° to the pounding surf that could exert up to 600 lbs. per lineal foot to displace them

By Robert L. Bowman
Construction Manager, Pipe Line Division
and J. H. Bevis
Project Engineer
Bechtel Corp.

TWO PROBLEMS had to be solved before these two submarine lines—a 20-inch and a 30-inch—could be laid two miles out into the Pacific Ocean from Barber's Point near Honolulu. The most difficult problem was to overcome the effects of the pounding surf that could, at times, exert as much as 600 pounds per lineal foot on 30-inch pipe. The second problem was to blast a ditch through about 4,000 feet of coral and smooth it so a pipe line could be pulled through it without damaging the concrete coating.

Solutions to both problems were devised by the Bechtel Corp. working in conjunction with Standard Oil Company of California Western Operations, Inc.,—the owner of the line.

The purpose of the two lines is to

link SOCAL's new 35,000-barrels-per-day refinery with an offshore mooring facility for giant sea-going tankers. Depth of water at the offshore end is 70 feet which is sufficient to enable 100,000-ton tankers to maneuver.

The route of the two lines strikes a 45° angle with the coast line, advancing some 7,100 feet out into the ocean as it traverses a distance of 11,500 feet from Barber's Point, the land terminus of the line.

Breakwater and trench protects pipe from surf and waves as it starts its seaward journey. A crane and sidebooms on the jetty carry the two-inch pulling cable to lessen friction of pull.

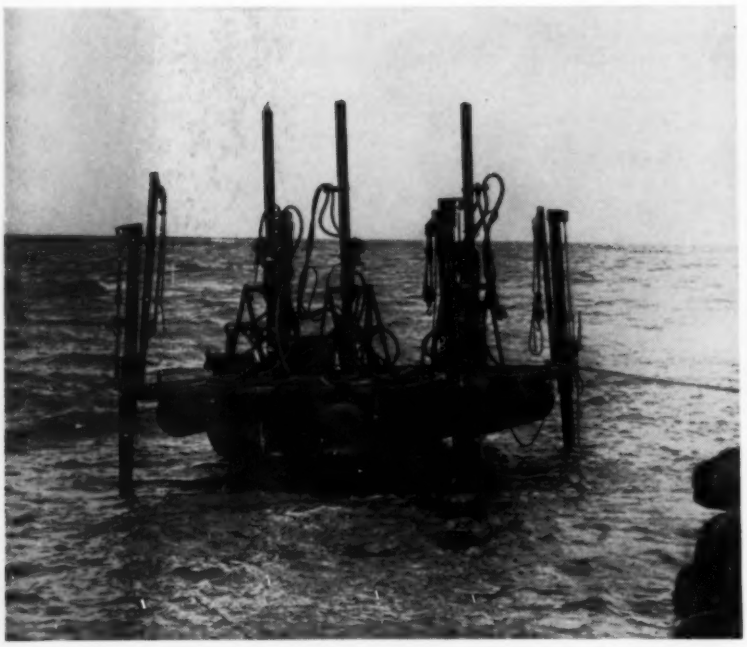
Description of the Two Lines. The 30-inch line will be used for unloading crude from tankers and the 20-inch line will be used as a bunker fuel line. The latter will also be used to load and unload heavy oils.

Pipe for both lines is API-5LX; the 30-inch pipe has a 0.50 wall and the 20-inch a 0.375 wall.

Coating. Each line was coated with asphalt mastic for corrosion protection. Then, the line was weighted with a reinforced concrete jacket, thick enough to give it 10-pounds negative buoyancy per lineal foot when empty. This weight was a practical balance between the need to protect the lines against wave action and the limitations of pulling forces required. The pipe was capped on the pulling end to prevent flooding.

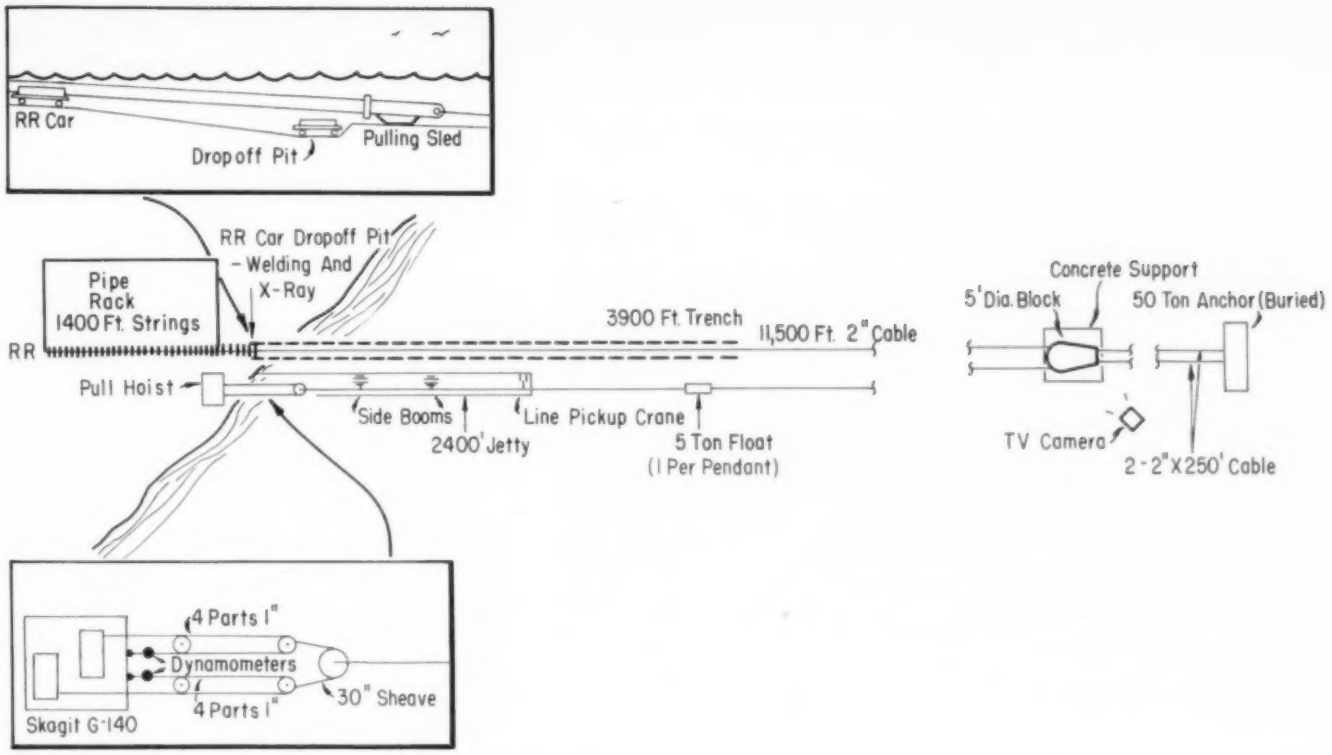
Jetty and ditch. Standard practice in submarine designs has been to trench and bury the lines through the surf area; beyond this point most lines are laid on the bottom.

The trench in this case was particularly important because of the oblique angle at which the pipe passes through the surf. Without the protection of the trench and the shelter



Mobile rig used for drilling shot holes alongside the jetty.

Pull-sled on the 20-inch line was designed to facilitate travel over the coral bottom as the pull progressed.



Rigging diagram for pulling the Hawaiian offshore loading lines from Barber's Point near Honolulu.

of a jetty constructed for the launching, the surf action might have made it impossible to keep the pipe on a straight line.

CALCULATING WAVE FORCES

The wave forces were of such vital importance to the launching and safety of these lines, that one of the first considerations was to calculate the possible forces which would be exerted on the lines. Here is the way these values were determined:

Forces due to non-breaking waves passing over the lines: The following formulas[1] were used:

$$U = \frac{\pi H \operatorname{Cosh} \frac{2\pi (d+Z)}{L}}{T \operatorname{Sinh} \frac{2\pi d}{L}} \operatorname{Cos} \Theta$$

$$F = \frac{C_D W U^2 A}{2g}$$

Where:

U = Particle velocity, fps
H = Wave height, ft.
T = Wave period, sec.
L = Wave length, ft.
d = Still water level, ft.
Z = Depth below still water level, ft. (neg.)
Θ = Angular particle displacement,
F = Force on pipe, lbs. per linear ft.
C_D = Drag coefficient, 1.5
W = Weight of water, lbs. per cubic ft.
g = Acceleration due to gravity, 32.2 ft./sec./sec.
A = Area of pipe, sq. ft.

A Design Wave Height of 13.5 Feet Was Established. This was based on local observation and the generally accepted relationship that waves break in a water depth of 1.25 times the wave height. Local records and knowledge of the ocean bottom conditions determined the other factors required to calculate the particle velocity.

For maximum velocity at the location of the pipe (d + Z) equals zero, Cos Θ becomes 1 and the formula reduces to

$$U = \frac{\pi H}{T \operatorname{Sinh} \frac{2\pi d}{L}}$$

Calculated Wave Forces. This calculation indicated that velocities up to 11.5 feet per second could be expected. At this velocity, the maximum calculated wave forces exerted by the design wave on the 30-inch line would be 600 pounds per lineal foot. (Concrete anchors designed on this basis were installed to protect the completed line.)

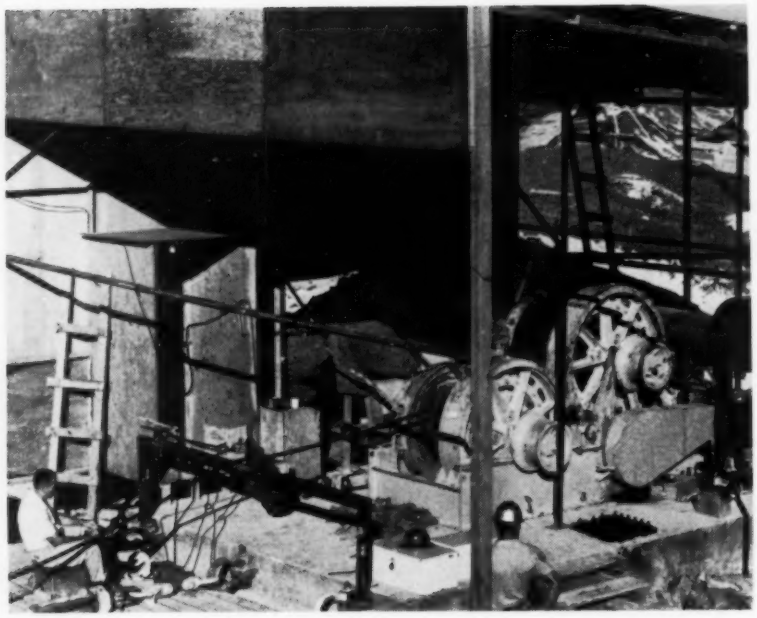
The magnitude of the problem can be pointed up by comparing the 600-pound wave force with other forces acting on the pipe. The pulling weight on the 30-inch line was based on a negative buoyancy of 10 pounds per foot. But the final flooded weight of the line was only 450 pounds per foot. Obviously, wave forces of 600-pound magnitude could displace the completed line unless steps were taken to protect it during operation.

CHOICE OF LAYING METHOD

Here are the three most important factors which influenced the choice of a method of constructing the line:

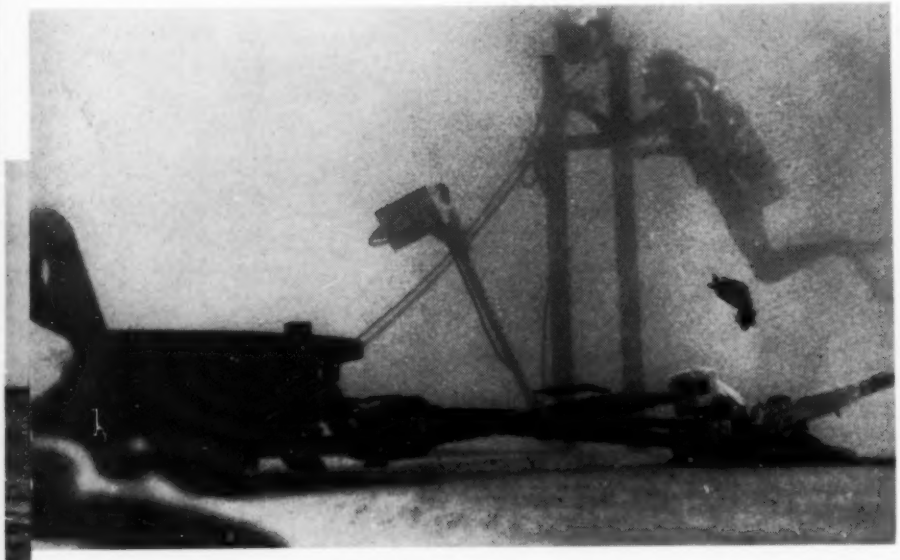
1. The oblique angle at which the lines pass through the surf meant that under unfavorable weather conditions, the waves could be passing broadside to the lines.

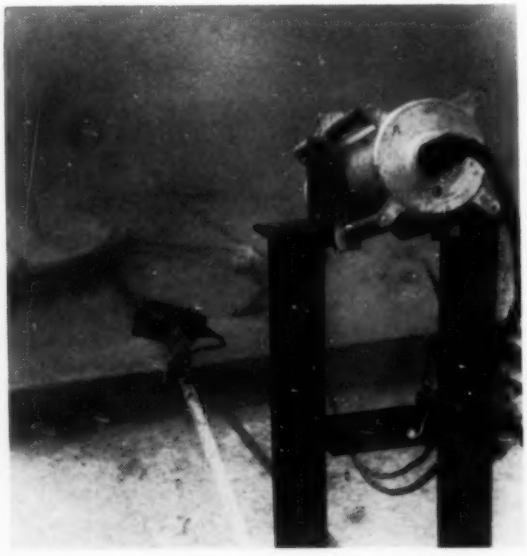
2. At the site there is a heavy surf



The two-drum winch onshore which pulled the pipe lines out into the sea. This winch could easily develop the maximum pull which was 85 tons.

A "gut" line inside the 30-inch will serve to keep the viscous crude flowing when hot water is circulated inside it. Here, welders are welding one of the 1,400-foot sections into the line.





Underwater TV aids in keeping check on the offshore sheave in 70 feet of water. Lights are set up to give best possible view.

action normally extending out 3,000 feet along the pipes and, on occasion, out as far as 3,900 feet.

3. The hard coral bottom meant great difficulty in excavating and backfilling a trench. Smoothing up a pulling path through the coral was a problem and the coral friction and wearing action on the concrete coating had to be anticipated.

DECISIONS

Design calculations called for a trench for the first 3,900 feet of the route. The various methods of achieving the trench were considered; at this point it became apparent that a jetty should be constructed to a point 2,400 feet from shore. This assured a calm water launching area for the sections of pipe, and at the same time, it provided the cheapest means of constructing the trench. Shot holes could be drilled, loaded and shot from the jetty.

Friction tests were made to determine the coefficients of friction for the concrete coating and the coral bottom and the wear on the concrete coating that could be expected during the pull. Since it would have been virtually impossible to float the line through the surf, it had to be pulled along the bottom. The friction tests indicated that this could be done.

How the Lines Were Pulled. The method selected for pulling the two lines had never been used on lines of this size and weight. Winches were set up along the launchway, and the wire rope which pulled the pipe into the water was spooled out from shore and back connected through a sheave in a 50-ton concrete block located some distance beyond the offshore end of the lines.

There Were a Number of Advantages of This Method. First, the line could be kept under positive control at all times during construction. The pulling hoist was on land. The cable was under constant tension. There was no slackening of lines required to relocate a barge after each section of line was pulled. The effects of foul weather were minimized. The high standby marine equipment cost which would be incurred in event of any delay was avoided. In addition to the operating advantages of the on shore method of pulling the submarine lines, the cost estimates showed it to be more attractive than the off shore pulling method.

Cable Selection. A two-inch, 6 x 25-IWRC wire rope was selected for the pulling cable. Its minimum breaking strength was 172 tons. The calculated load due to friction of the concrete coating, the cable drag and the sheave friction amounted to an estimated 85-tons maximum. This was based on relieving a good part of the cable drag with cable floats and cancelling out railway friction on shore with supplementary power as required. The cable was to operate just slightly below its yield point.

The pulling cable was 23,000 feet long. A single piece 11,500 feet long was required to reach from the pipe end out to the sea sheave. The return leg was made up of removable cable pendants. All cable ends terminated in poured zinc sockets.

HOW THE LINES WERE LAID

For the general layout and operational plan see the accompanying drawings. The pipe sections—1,400 feet long—were assembled onshore and moved over to railway cars, which transported the pipe into the water and then dropped from beneath the pipe into a pit.

The pulling end of the pipe was sealed with a valve for final flooding.

About the Authors

Robert L. Bowman, (top) is manager of construction for the Bechtel Corporation Pipe Line Division and a vice president of Bechtel International Corporation. In the past 20 years, Bowman has been associated with every major pipe line the international company has built—among them Tapline, PG & E's "Super-inch" and the Trans Canada Pipe Line. He started his construction career in 1924 with Standard Oil Company working on a 12-inch pipe line from Haynesville, La., to El Dorado, Ark., one of the earliest oil pipe lines in the South.

J. H. Bevis is a senior engineer in Bechtel Corporation's Refinery and Chemical Division. As project engineer he was responsible for ship unloading facilities at Standard's Hawaiian refinery, which include a 100,000 dwt tanker mooring and submarine lines connecting it to shore. A University of California graduate in 1948, Bevis was associated with General Electric Company and with California Research & Development Company prior to joining Bechtel in 1954.

A pulling sled was provided to facilitate riding over the sea-bottom irregularities.

The Offshore Sheave and Block. The 11,500-foot length of wire rope was attached to the head end of the pipe and laid out to a barge where it was reeved through a five-foot diameter sheave. The sheave was then lowered to the bottom where it rested on a concrete sled, anchored by two parts of a two-inch wire rope—each 250 feet long—to a 50-ton concrete anchor block.

The return side of the pull line made up of 1,400-foot pendants corresponding to the length of the pipe sections on the launchway, was buoyed at each connection by a five-ton float. The wire rope line alongside the jetty was lifted by a crane and walked along by sidebooms to cut down on friction drag.

The Winch. A two-drum Skagit G-140 was reeved with one-inch wire rope as shown in the drawing. A dynamometer was provided as a check on each drum.

The Second Line. After the 30-inch pipe line was pulled into place, a pull back cable was connected. By means of this cable the entire hookup was rendered back to its original position. The 20-inch line was then pulled in the same manner as the 30-inch.

Engineer-Constructor. The project was a joint-venture responsibility of Bechtel Corporation and Hawaiian Dredging and Construction Company, Limited. Engineering was the responsibility of Bechtel Corporation, Refinery and Chemical Division.

ACKNOWLEDGMENT

The onshore pull approach to launching submarine lines was devised by James F. Brady, Bechtel Corporation's Refinery and Chemical Division construction manager. The details were worked out in collaboration with the Pipe Line Division. Refinery and Chemical Division Project Engineer for the Hawaiian Refinery was D. R. Ferguson. Standard Oil Company's Manufacturing Department personnel responsible for construction of the new Hawaiian refinery established an evaluation committee of pipe line, refinery and marine experts from Standard Oil, Hawaiian Dredging and Bechtel. This committee thoroughly studied and accepted the proposed construction methods.

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FLYING OFF to the right-of-way about a half mile distant. Round trips took 1 to 2½ minutes. For the entire job the helicopter averaged stringing better than 22 joints per hour of flying time.

LIFTING OFF. The pilot gently eases the joint of 30-inch pipe into the air. In case of trouble he can press a button and drop the pipe into a clear area almost instantly. The cost of this helicopter service runs $300 per hour.

It Flies Through the Air

Stringing two-ton joints of 30-inch pipe with a helicopter speeds a "mudding-in" job

By Donald M. Taylor
Engineering Editor
PIPE LINE INDUSTRY

FREQUENT RAINS had turned the South Texas rice fields along the Transcontinental Gas Pipe Line Corp. right-of-way just west of Houston into an almost impassable bog. A Houston Contracting Company spread that normally laid one to two miles of completed pipe line per day had been slowed to a fraction of this speed as men and equipment floundered in sticky, viscous mud. But slow as this "mudding in" operation was, the pipeliners were laying Transco's new 30-inch loop too fast for the stringing up ahead. It was only a matter of time until the belly-deep mud ran the pipe gang out of pipe.

Veteran crews of J. O. (Red) Willett Pipe Line Stringing Corp. lugged as little as 600 feet of the heavy pipe onto the right-of-way during a hard day's work. But even this meager progress was achieved only at an outrageous effort, for the winching, shoving and dragging necessary to snake the pipe into place not only damaged equipment, it churned the right-of-way into a muddy soup that further slowed the progress of the pipeliners that followed.

The origin of this trouble was a strata of tight clay about two feet below the surface of the ground. This barrier to subsurface drainage can hold water in the soil for a week or more after a rain. But, to make matters worse, the rice fields in the area are contoured to husband surface water, normally one of the most costly ingredients that goes into a rice crop, and a four day stretch of dry weather would find free water still standing along the right-of-way.

A few years back, this situation would have generated an *impasse*. Most likely pipeliners would have been forced to wait out the weather. But in this instance, Walker Boggs, president of the Willett company, had a ready-made solution. Last spring his company had subbed out

HOOKING ON. Pipe handlers hook the chime hooks on the wire rope sling into either end of the joint of pipe which with the three oak skids in either end weighs over 4,000 pounds.

APPROACH. The pilot brings the helicopter in at about 20-foot altitude, hovering over the truck on a loading area just off a farm-to-market road in the mudded-in rice fields west of Houston.

With the Greatest of Ease

TALKER sitting in door of helicopter talks pilot into proper position for loading.

SKIDS in ends of each joint take ride along with the 4,000-pound pipe.

the stringing of 21,000 feet of 24-inch in the Trinity River bottom to Petroleum Helicopters, Inc. (see PIPE LINE INDUSTRY, June 1960, Page 36). This aerial lift had proved successful despite the obstacles that ran the cost of stringing to about 80 cents per foot. (Summed up, these obstacles were: (1) tall trees that required the helicopter to climb to considerable height after picking up its load; (2) tall trees bordering a narrow right-of-way that kept the helicopter too high for proper stringing and (3) long hauls that ate up the flying time of the $300-per-hour craft).

Boggs reasoned that the cost of the operation would be reduced on the Transco right-of-way because of the flat terrain. Moreover, a network of farm roads made it easy to truck the pipe to loading areas close to its final destination greatly reducing the hauling distance. As it worked out, the maximum haul ran but slightly more than ¾ of a mile and operating altitude ran from 20 to 50 feet.

When Boggs approached Houston Contracting for additional backing in the aerial stringing, they were glad to give it serious thought. Houston had long enjoyed the reputation of living up to both the letter and spirit of a

PIPELINERS AND FLYERS who direct the job. From left to right, Sam Hill, Freeman Ueckert, Whitey Thompson, and John Sharbrough.

contract, and as matters had been going, the scheduled completion date for the Transco work appeared elusive to say the least. Too, there was the matter of right-of-way damage to be considered; by eliminating the trucks, Athey wagons and tractors involved in stringing, the right-of-way would remain relatively undisturbed until the arrival of the pipe gang.

Transcontinental Gas gave quick approval to aerial stringing. The operation promised to reduce off right-of-way damage claims and provide a means of speeding up construction to boot. As a matter of fact, Transco was one of the very first companies to try the helicopter in pipe stringing. Early last year 17 joints of 24-inch pipe had been flown to the Transco right-of-way near Kaplan, La.

Plan for Aerial Stringing. From the grid of farm service roads crossed by the pipeline, Willett and Petroleum Helicopters, Inc., selected several loading points and constructed loading areas. The latter were simply shell roads running 200 feet at right angles to the farm-to-market road, long enough to enable the pipe trucks to discharge their cargo into the air without exposing the helicopter to the danger of traffic, power lines, etc. along the roadside.

Weight of the Pipe. Each joint of 30-inch 0.312 wt pipe was 40 feet long and weighed about 3950 pounds. But additional weight was added; three-oak skids were loaded into either end of each joint bringing the weight above 4,000 pounds at lift off.

Hauling from the Storage Yard. Transco had stored the pipe near its Station 23 north of Houston and the stringing operation started from this point. The pipe was trucked to the loading points where individual trucks waited in turn to move under the helicopter.

Loading the Pipe into the Air. The helicopter approached the loading zone at an altitude of about 20 feet as shown in the accompanying photos. Two handlers working the truck, placed the chime hooks on the special sling into either end of a joint of pipe. The helicopter took a strain and eased the joint up into the air. It then darted toward the stringing point at speeds up to 60 mph.

Unloading. The joint of pipe and its six skids were set on the ground, overlapping the previous joint and two handlers removed the chime hooks. The speed of the "chopper" back to the loading zone was said to be about 100 mph.

Round trip time varied from 1 to 2½ minutes depending on the distance from the loading area to the stringing point. On the first day of aerial stringing, the helicopter delivered 85 joints of pipe to the right-of-way. On the second day, the crew improved its record and toted up 150 joints; then raised the tally to 210 joints on the last day.

The total footage of pipe strung was 17,776 feet.

Cost. A helicopter of this type represents an investment of about $265,000! For this reason, it is obvious that hourly depreciation will run high. But in addition, the craft requires a sizeable crew. For this operation, it was manned by two pilots who took turns at the controls: each flew 40 to 50 minutes on alternate hours. Every hour, the service crew kept the craft on the ground for a period of 10 to 20 minutes to fill it with gasoline and check it over.

For this particular job, the flying time ran 20 hours and the cost was $300 per hour, bringing the job to $6000. This ran only 33½ cents per foot for the helicopter lifting and because of the many advantages aerial stringing offered in these circumstances and ground conditions, the economy of the venture was sound.

Many pipeliners visited the job during the time the helicopter was working. Some of them envision a great growth in the use of helicopters for pipe line work in the future—particularly in winter. One company faced with a strong need to lay pipe line in dead of winter is planning to employ at least one helicopter on its job. Preliminary plans call for 30-foot lengths of yard coated pipe to be hauled from road sides to the right-of-way. A bending machine stationed nearby can take care of bends without ever traversing the right-of-way.

—The End

Lowering-in on the Karadag-Yerevan gas line. This pipe line crosses the Semyonov and Sevan mountain passes.

How Soviet Gas Industry Is Growing

Russia has seven-year plan that calls for about 16,100 miles of additional gas lines

By A. K. Kortunov, Head of USSR Central Gas Administration

IN A SPEECH at the New York Economic Club in September, 1959, N. S. Khrushchev said that *"excellent prospects are opening up before the gas industry. So far America leads the world in the output of gas and its surveyed resources. However, in recent years we too have been making increasing use of natural gas. Our geologists have discovered gas deposits so large that they will suffice for dozens of years. This gives us the chance to increase the output and consumption of gas still more and outstrip you on that point as well."*[1]

Soviet's seven-year plan. Under the seven-year plan our gas production is to multiply five-fold reaching a total of 150 billion cubic meters by 1965. In

EDITOR'S NOTES

[1] This will take some energetic "*outstripping.*" The United States has about 184,000 miles of cross-country gas pipe lines, 58,000 miles of field gathering lines and some 387,000 miles of gas distribution lines, or a total of 629,000 miles. What's more, the U.S. gas pipe line mileage is increasing about 10,000 miles every year.

[2] This article was written late in 1960 so completion dates and production rates are as stated then.

[3] Webster says *mazut* is, "Russian residue of petroleum, used as an oil."

the seven-year period 26,000 kilometers of gas pipe will be laid, bringing gas to more than 500 towns having a combined population of tens of millions. Accordingly, one may note that gas production will reach a total of 53 billion cubic meters this year.[2] This year the two republics of Georgia and Armenia have already received natural gas. Byelorussia will get it before the end of the year.

After the 700 km. Dashava-Minsk trunkline begins operations we shall be able to finish work this year on the Ivatsevichi-Vilnius branch-line to bring gas to Lithuania and Latvia and thus fundamentally change the pattern of fuel supply in the Baltic republics which have no power resources of their own.

We have just completed laying the Transcaucasian line. The Akstafa-Yerevan trunkline inaugurates a single gas-supply network for the three Transcaucasian republics of Azerbaijan, Georgia and Armenia. Besides Tbilisi, Yerevan and Rustavi, dozens of other towns here—including Akhsu, Dilijan, Sevan, Kirovsky, and Ijevan—will get gas before the end of the year. This will make it possible to save three million tons of *mazut*.[3]

The completion this year (1960) of Central Asia's first big line, the Jarkak-Bukhara-Samarkand-Tashkent, will initiate the large-scale introduction of gas to Uzbek urban areas. In addition to Samarkand and Tashkent, Chirchik, Begovat and several other towns will

Ditching the Karadag-Tbilisi-Yerevan gas pipe line.

Coating and wrapping pipe line near city of Gomel (Byelorussian SSR).

Automatic welding on Gomel, Byelorussian SSR gas line.

soon have gas. We are also completing the lines called for under seven-year plan targets to supply gas to iron and steel mills and chemical plants in the southern part of the country. We are going to put the Taganrog-Amvrosiyevka, Yenakiyevo-Slavyansk and Taganrog-Zhdanov lines into operation. Several Donbas cities, including Artyomovsk, Gorlovka, Druzhkopka, Konstantinovka, Chasov Yar, Makeyevka, Slabyansk, Shakhty and Verkhnedneprovsk, will get gas this year to meet the mounting requirements of the metallurgical and chemical industries.

As hitherto, special attention will be paid to supplying gas to the central industrial areas and the large cities. The completion this year of the southern section of the Moscow circuit will improve the gas supply to industrial establishments and towns in the Moscow Region. Several towns, including Yegoryevsk, Stupino, Elektrostal, Noginsk and Klimovsk, will get their gas from Stavropol.

At the same time we are going to proceed with the laying of Europe's largest line, a 1-meter-pipeline from Krasnodar Territory to Serpukhov. The Shchokino-Ostrogozhsk and also the Shebelinka-Ostrogozhsk sections are to start operations this year.

One of the largest trunklines being laid is the 652-km. Saratov-Gorky line. Work on it will continue this year in the direction of Yaroslavl, to produce gas for the towns of Ivanovo, Vladimir, Yaroslavl and Cherepovets.

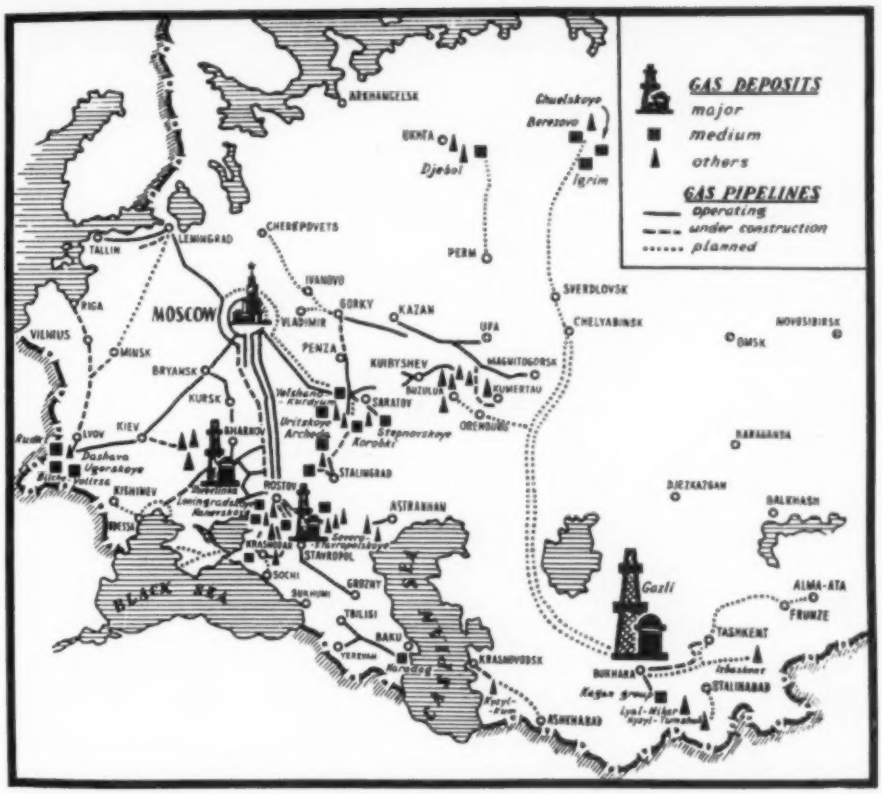
Under the seven-year plan gas is to be extensively used in industrial areas in the Urals.

The newly discovered (1959) Bashkirian gas deposits are of very great economic importance. A preliminary estimate puts these resources at roughly between 200 and 300 billion cubic meters. Since these deposits are very near the Magnitogorsk iron and steel mills, it has been decided to start their exploitation this year (1960). Output may reach 3 million cubic meters a day before the end of the year (1960). A line is to be built from Kumertau to Ishimbai this year.

The gas discovered in Beryozovo District (Tyumen Region) will meet the gas requirements of the Northern industrial areas of the Urals—Serov, Nizhi Tagil and other towns.

This year the Central Gas Administration will start laying one of the largest trunklines—a two-pipe line—between Bukhara and the Urals.

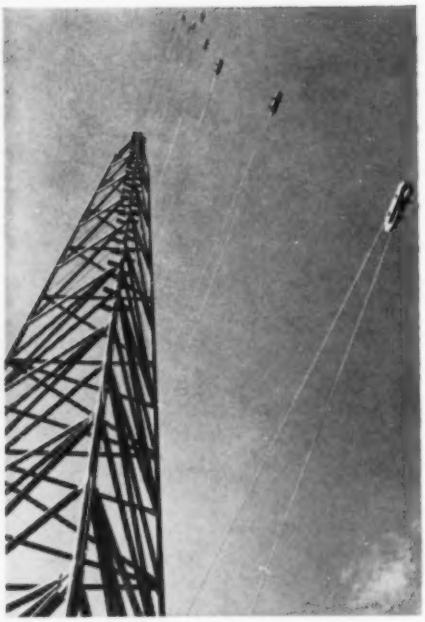
In the next two to three years, despite certain difficulties involved in technical reconditioning, the administration will complete, in the main, the laying of the trunk-lines slated by the seven-year plan for the European part of the USSR. Consequently, we shall soon have fine facilities for carrying about 100 billion cubic meters of gas to various economic areas in the country.



In 1956 only 77 Soviet cities had natural gas. In 1959 this figure had risen to 148 and by the end of 1960 a total of 218 cities were receiving gas. In 1960 gas lines were extended to Minsk from the western regions of the Ukraine. Carpathian gas will go to Vilnius and Riga. Constructed last year was the Shebelinka-Moscow line. Russians say dotted line at right is route of the "world's biggest gas pipe line." It would be 2,100 kilometers long. Editor's note: A number of U.S. gas lines are much longer, however.

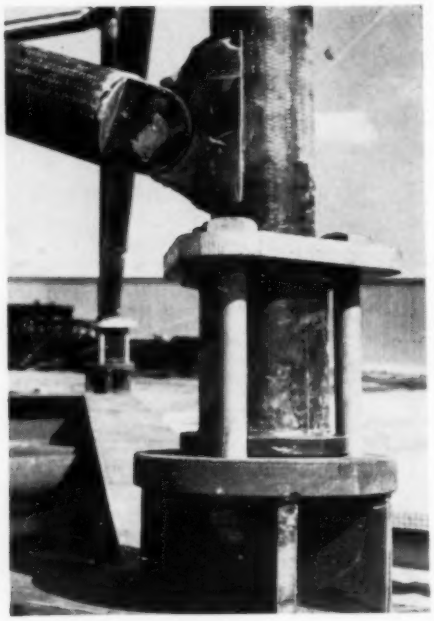
CONVERSION OF METRIC-SYSTEM FIGURES

Estimated Gas Production at the end of 1960 . . . (53 billion cu. meters)	1.86 trillion cu. ft.
Projected Gas Consumption 1965 (150 billion cu. meters)	5.2 trillion cu. ft.
Gas Pipe Line Mileage Planned for 7-year Period (26,000 km)	16,100 miles or 2300 miles per yr.
Europe's Largest Line (one-meter diameter)	39.37 inches
Estimated size of Bashkirian Gas Field (200-300 billion cu. meters)	7 to 10 trillion cu. ft.
Estimated Daily Output of Bashkirian Field (1960) (3 million cu. meters)	105 MMcfd.



Fiber glass and epoxy tower under test. The pull from the wire rope at right simulates the force of a wind blowing up to 116 miles per hour. The tower withstood this test. Note the steps leading to the top. The tower solves the corrosion problem.

Raising the tower. Steel tower in background was used to pull against fiber glass tower during tests. Weight of 100-foot tower is about 1250 pounds. This requires less foundation than most towers. Cost is comparable to that of most steel towers.



Coupling and anchor for the tower are shown here. The connector takes care of the change with height in angle between the legs and cross members. This tower is "transparent" to radio waves and as a result will likely increase the signal range.

Non-Metallic Radio Tower

It solves corrosion problems; and, because it is "transparent" to radio signals, it reduces pattern degradation and antenna requirements

A 100-FOOT RADIO TOWER made of fiber glass and epoxy resin tubular goods and fittings recently withstood the equivalent of a 116-mile wind in simulated tests carried out on the campus of the University of Houston. The tower weighs only 1,250 pounds and its erected cost taking into account the lighter foundations etc. is slightly less than that of conventional steel towers according to the manufacturer's engineers.

For communications engineers the most intriguing aspect of the new tower is its transparency to radio waves and its dielectric qualities. The towers absorb no energy, and presumably permit a slightly stronger signal all things equal. The glass-resin construction reduces the effect of radio wave scattering by eliminating the presence of all resonant reflective elements in areas of the antenna. This, in turn, further eliminates possible pattern degration.

A report prepared for the U.S. Air Force states that "employment of the VHF multicoupler and the fiber glass tower allows a four-to-one reduction in the number of antennas required for a particular ground environment."

The dielectric properties of the tower are excellent: The volume resistivity is 1.6×10^{13} ohm-cm; dielectric breakdown is 535 volts/mil (short time—⅛-inch thick.)

A key feature of this free standing tower is an ingenious button-type connector. This allows any diagonal member or bracing to join the vertical pipe at any desired angle. This takes care of the dimensions of the tower which change with its height.

The first models of the tower were made of 3½-inch fiber glass and epoxy resin pipe. The fiber glass is braided and centrifugally cast with the resin. The resulting material has exhibited tensile strengths of 14,000 psi to 32,000 psi. The various fittings used in the construction were made of polyester and fiber glass.

One of the features incorporated in the tower which will be welcomed by maintenance men is the steps which project from one of the tower's legs. They simplify light changing etc.

ACKNOWLEDGMENT

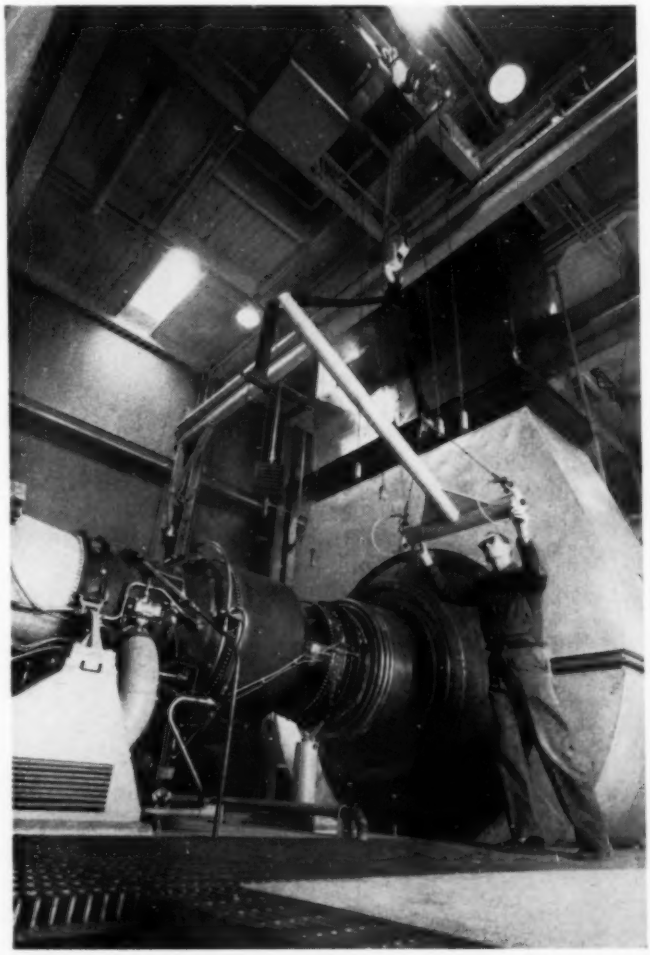
Photographs courtesy of Fibrecast Company, Division of Youngstown Sheet and Tube Company.

10,500-HP Aircraft Turbine Logs 1300 Hours Driving Compressor

Columbia Gulf says performance is even better than expected in first part of projected 8,000-hour run

AT 9:30 A.M. OCT. 31, 1960, a Columbia Gulf Transmission Co. employe pushed a button at the company's Clementsville, Ky., compressor station that started a new type gas-fired turbine on an 8,000-hour experimental run. The results of this test will be followed with keen interest throughout the gas industry, for the unit holds promise of greatly reducing costs for compressor horsepower. Its installed cost probably runs about half that of reciprocating engine compressor units installed in the conventional manner. Such reduction in station horsepower costs could enable engineers to space stations more closely in certain areas to increase throughput more economically.

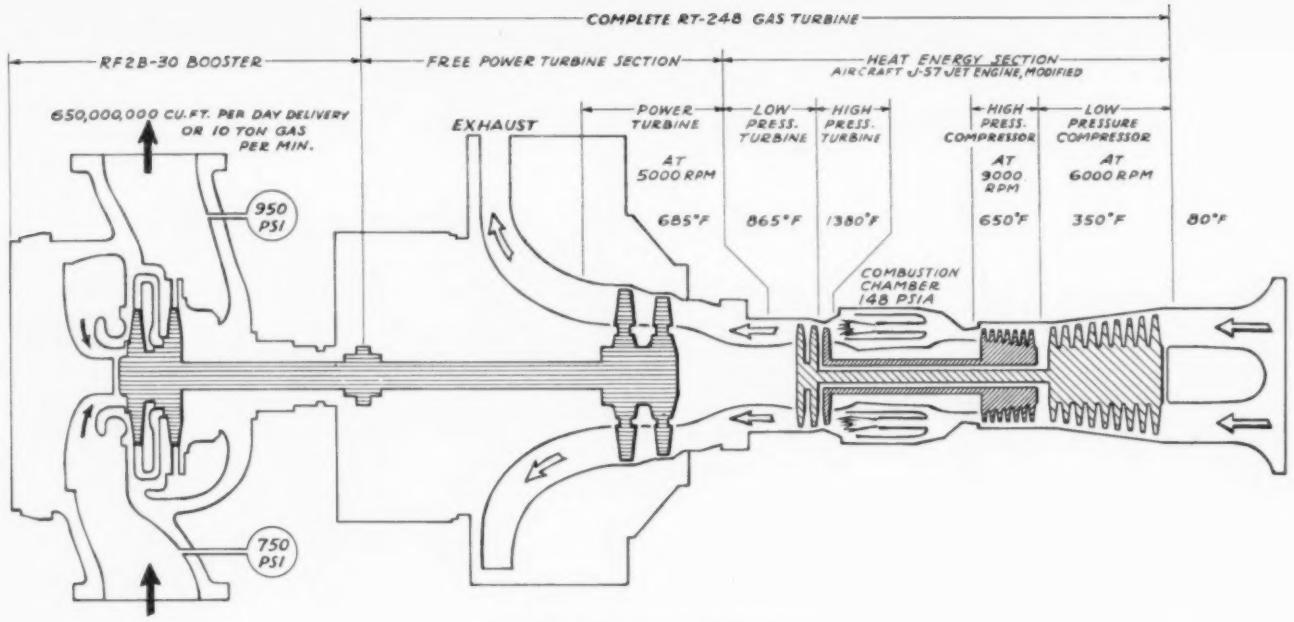
The new unit is a hybrid—being part jet aircraft engine and part load turbine. The jet unit fulfills the role of generating heat energy which drives a two-stage load turbine. The latter



Light jet engine at left can be lifted out and replaced in four hours using the relatively small chain hoist shown here. Load turbine is at right, in front of exhaust duct.

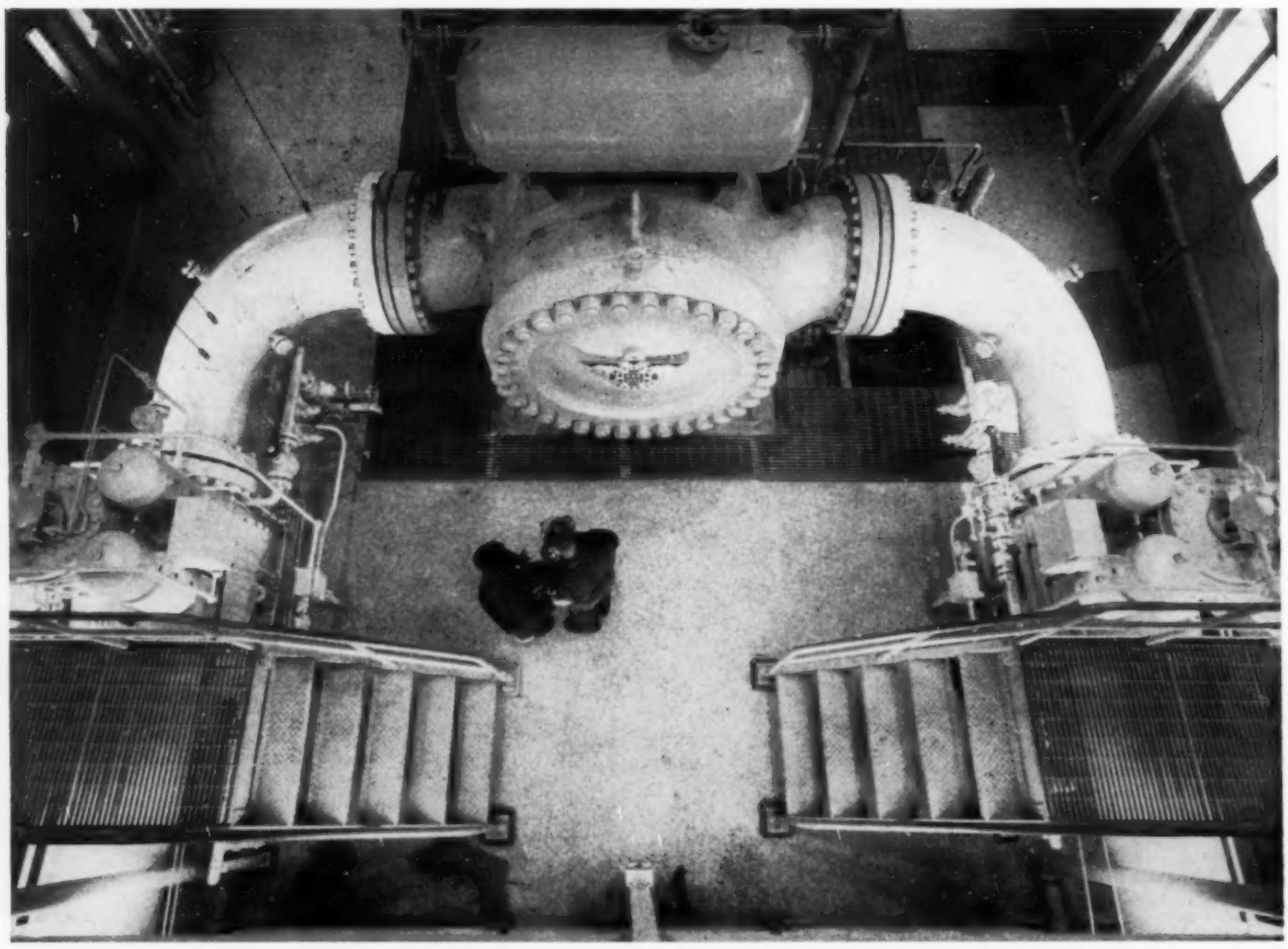
Building is small but horsepower is high at the Clementsville, Ky., station where low cost jet aircraft turbine is undergoing trial run. Building is anodized aluminum.

Wearing noise attenuators, Columbia Gulf division superintendent, L. John Amy watches gages over centrifugal compressor. Suction ranges from 700 to 750 psi; discharge from 900 to 950 psi as the station handles 600 MMcfd.

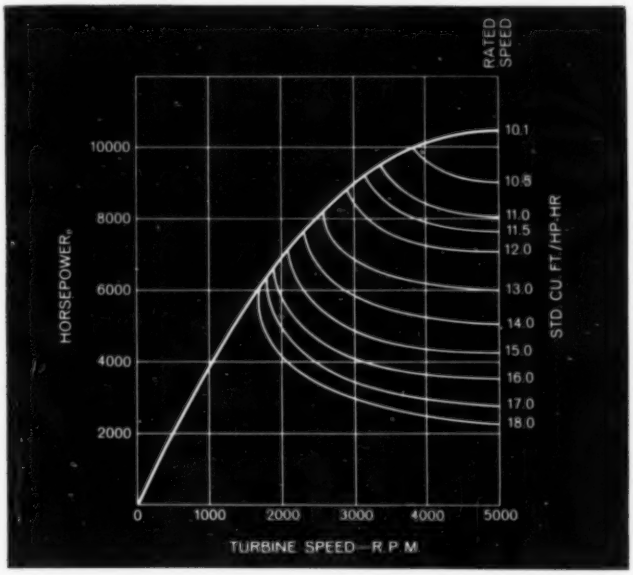


OPERATING DIAGRAM

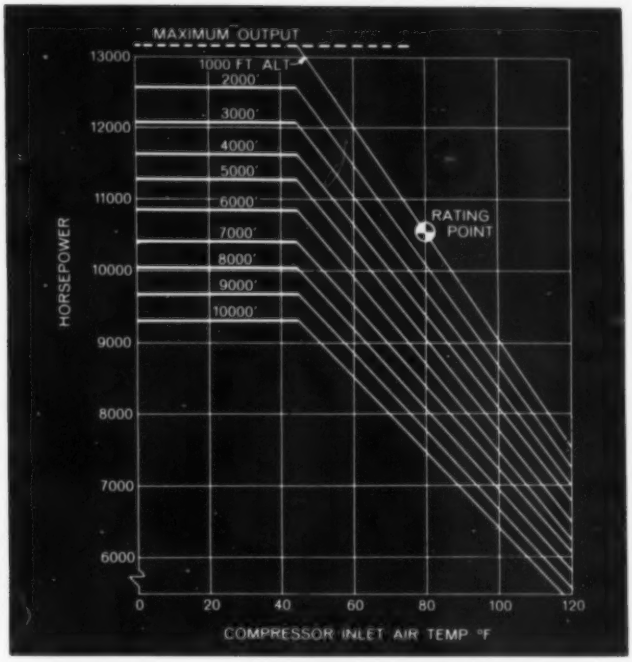
Operating diagram. Note that two stages of axial flow compressor are driven by separate turbine wheels The reason regenerator is impractical is apparent from this diagram. Compressed air entering combustion chamber is 650°F while exhaust temperature is only 685°F. This temperature difference is not sufficient to make heat exhange practical.



Centrifugal compressor (bird's eye view) is direct-coupled to load turbine which utilizes heat energy of aircraft turbine for power.



Fuel consumption. Note that efficiency is best at full load and top speed.



Altitude and temperature affect the performance of turbine. On cold day Columbia Gulf engineers have run unit up to 12,000 hp for short time.

is coupled to a centrifugal compressor.

Objective of the trial run is to determine whether or not the jet engine will be able to operate continuously for long periods of time and meet the requirements of pipe line operations. The designers believe that it will be able to run for about 8,000 hours between overhauls. Moreover, they feel that the overhaul can be effected by substituting a spare unit (requiring about four hours) for the operating one and flying the latter to the factory for a complete tear-down and reassembly.

Columbia Gulf has installed the 10,500-hp unit at an existing compressor station site where it will handle about 650,000,000 cubic feet per day. Should the volume exceed 660 MM, the nearby reciprocating station will start up.

Suction on the two-stage compressor runs about 700 to 750 psi and the discharge runs about 900 to 950 psi. Fuel consumption averages slightly more than 10 cubic feet per horsepower hour which is equivalent to a thermal efficiency of 25 percent. This is considered about average for the pipe line industry—although it is considerably below that of new reciprocating engines available today.

How the Unit Works. The jet aircraft engine (a model identical in most respects to some 18,000 units in military and civilian aircraft today) is a hot gas generator. It discharges some 129,000 cubic feet of hot air and gas per minute at a temperature of 865°F and a pressure of 29 psia. From the operating diagram you will note that the axial flow compressor is two-stage driven by separate turbine wheels. The compression ratio is 10 to 1.

The hot gases are expanded across a two-stage turbine which has both wheels cantilevered so bearings are not exposed to the heat. It is designed for radial on-center expansion. The diffuser is vaneless and of high efficiency. This power turbine unit is designed to operate for about 40,000 hours between overhauls.

The RT-248 Gas Turbine—

Heat Energy Section, Aircraft J-57 Jet Engine	
Weight	4000 lbs.
Speed at full load	5000 rpm
Volume Intake Air	129,000 cfm
Volume fuel consumption	1750 cfm
Air: Fuel Ratio	79.6:1
Jet discharge pressure to load turbine	29 psia
Jet temperature at discharge to load turbine	865 °F
Compression Ratio of Jet Engine	10:1
Estimated run between overhauls	8000 hrs.
Load Turbine—Two stage turbine with overhanging wheels.	
Weight	21,000 lbs.
Speed at full load	5200 rpm
Inlet temperature	865 °F
Exhaust temperature	685 °F
Estimated run between overhauls	40,000 hrs.
Centrifugal Compressor Two-stage compressor, RF2B 30.	
Speed	0–5200 rpm
Suction pressure handling 650 MMcfd	750 psi
Discharge pressure handling 650 MMcfd	950 psi

Why No Regenerator? The answer to this question is obvious. From the operating diagram you will note that the temperature of air entering the combustion chamber is 650°F and the exhaust gas temperature is 685°F. This difference of only 35°F is not sufficient to make heat recovery practical.

By late December the new unit had passed its preliminary tests with flying colors and Columbia Gulf engineers were making no secrets of being pleased with its performance. The only downtime had been logged against the controls and Columbia Gulf was proceeding with engineering to make the unit automatic and remotely controlled.

The test run is specified to be 8,000 operating hours or 18 months service time, whichever comes the soonest. Chances are, the 8,000 hours (about one year) will be soonest if its performance continues to match that of initial operation.

ACKNOWLEDGMENT

PIPE LINE INDUSTRY acknowledges assistance of Columbia Gulf Transmission Co., Houston, The Cooper-Bessemer Corp, Mt. Vernon, Ohio, and Pratt & Whitney Aircraft Division of United Aircraft Corporation, East Hartford, Conn., for the engineering information about the Clementsville station equipment.

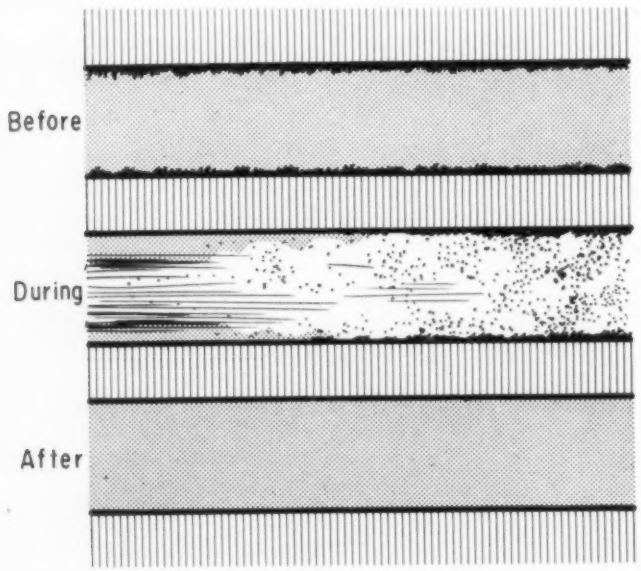
Pipe Line Pete's

IDEAS FOR THE FUTURE!

By **Donald M. Taylor,** Engineering Editor

Rumor: Internal Sand Blasting Ups Gas Flow!

This one comes right hot out of the rumor factory! Word is going around that internal sand blasting can achieve a sizable increase in gas flow—partly as a result of the cleaning and partly as a result of the high velocity sand particles wearing and smoothing the anchor pattern of the internal surface of the pipe.



Actually, some basis for this improvement was established in tests conducted by TGT and others on internally coated pipe. (See Pages 41 and 42, July 1959, PIPE LINE INDUSTRY.) TGT reported that the mere cleaning of the line increased the flow in certain ranges about four percent. A roughness study stated that the cleaning (by pigs and means other than internal sand blasting) reduced the anchor pattern from 912 micro-inches to 520 micro-inches. Of course, internal coating was then applied to further reduce the depth of the anchor pattern, resulting in the well-known increase in efficiency described in the article.

According to rumor, a sizable reduction in anchor pattern (down to 50 micro-inches) is being achieved by the peening and wearing of the sand and the resulting increase in gas flow efficiency is a sizable one. No official word has yet been released.

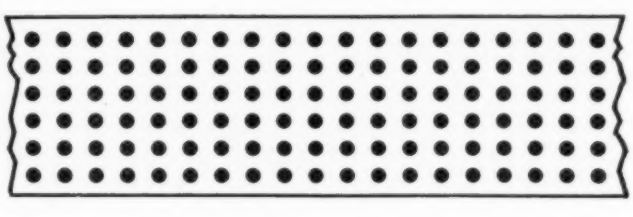
A recent issue of PANHANDLE LINES—a publication of Panhandle Eastern Pipeline Co.—says the technique of blowing sand through the pipe with high-pressure gas can produce an excellent cleaning job. Panhandle's subsidiary, Trunkline Gas Co., has tried the method of cleaning on eight miles of 26-inch line in Mississippi, says the article. Several other companies have also used this method for cleaning.

Panhandle blew 5,000 pounds of sand through 5 miles of eight-inch line in about one hour using gas pressure of 15 to 60 psi. Panhandle then blew the line free of sand and found the internal surface very clean.

If this method of cleaning is truly smoothing the internal surface of the pipe, it could perhaps result in less material being required for internal coatings. Other companies may be satisfied with the increase in efficiency achieved by the sand blast cleaning.

Computer Reads 'Memory' Film in Billionths of Second

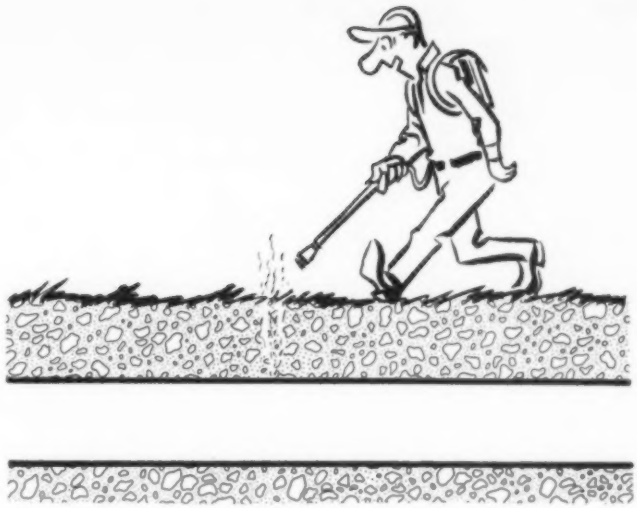
A thin memory film that consists of tiny dots of magnetic material deposited on a glass plate base to a thickness of a few millionths of an inch is being regarded as a highly important breakthrough in computer technology. Seems these miniscule desposits of iron, cobalt, nickel alloys can be magetized in specific directions and later the direction can be translated in terms of "Yes" or "No". These directions of the magnetic signals make up the language of computers and the new Remington Rand Univac 1107 computer can read them in billionths of a second!



However, the great promise of the new film has yet to be realized; for the new computer utilizes it for only a few hundred memory units, because of the high cost of the new process. The memory drum units are still with us, although, their speeds are rated in mere millionths of a second.

Nitrous Oxide-Infrared Gas Detector to Get Field Test

Remember just one year ago when PIPE LINE INDUSTRY carried an article pointing out the possible advantages of carrying dissolved nitrous oxide in hydrostatic test water so that small leaks in a pipe line could be located with an infrared detector? Well it seems one of our readers—a man of action—read the article which described a process developed at Southwest Research Institute in San Antonio, then picked up the phone and called the company that sponsored the work. From the latter, he obtained an exclusive franchise for the use of the technique and has arranged for its operational testing in the near future. Guess the name of this enterprising fellow's favorite *idea* magazine!



All Magnetic Computer Superior in Many Ways?

Smaller, less expensive, more versatile and more reliable computers may be on the way according to Stanford Research Institute. A new logic system has been designed that uses magnetic elements and connecting wire only.

To understand the importance of this development, take a look at the history of computers. First ones used relays; then along came vacuum tubes, and then transistors. Memory units of many modern computers are composed of tiny torodial magnetic cores.

Magnetic cores were excellent as memory units, yet they could not be used in logic circuits because current could flow through them in opposite directions. Then came diodes which limited back flow.

SRI then developed the Multi-Aperture Devices—called MADs which have made the all magnetic computer possible. Under the sponsorship of the Air Force Cambridge Research Center, a project team has demonstrated that a unit with an all magnetic logic system will perform addition, substraction and multiplication. It can mean that more inexpensive and superior computers lie ahead. Perhaps we will even have them in the home. Pipeliner's wives could use them to determine when their husbands will be home!

Rules of Thumb

and Engineering Data Sheets for the Pipeliner's field notebook

$25 for Engineering Data Sheet $15 for Rule of Thumb

These practical aids give quick, reasonably accurate answers to design, maintenance and cost estimating problems. PIPE LINE INDUSTRY will pay $25 for each chart, nomograph or data sheet published—$15 for each Rule of Thumb. Send your ideas to PIPE LINE INDUSTRY, P. O. Box 2608, Houston, Texas

Miscellaneous —43—Find the Working Strength of Manila Rope

The working strength of Manila rope is approximately 900 x (diameter)^2.

or

$$W = 900\,d^2$$

Example: What is the working strength of a ¾-inch Manila rope?

The maximum recommended pull is

$$W = 900 \times \frac{3 \times 3}{4 \times 4} = 506 \text{ lbs.}$$

Example: Find the maximum working pull for a 1½-inch Manila rope.

$$W = 900 \times \frac{3}{2} \times \frac{3}{2} = 2025 \text{ pounds.}$$

For rope diameters greater than 2-inches, a factor lower than 900 should be used: in working with heavier rigging it is well to refer to accepted handbooks to find safe working strengths.

WHAT'S HAPPENING
IN PIPE LINE CONSTRUCTION

By Donald G. DePugh, Construction Editor

River Crossing Completed

Trans-Southern Pipeline Corporation has completed 10-inch crossing of the Tombigbee River as the first step in its 1,300-mile LPG line which will extend from Houston to Virginia. Pipe was laid 11 feet under river floor; river was 365 feet wide and 40 to 50 feet deep at this point. Sharman, Allen, Gay & Taylor, Inc., was the contractor.

Trunkline Gas Company Awards Contracts on 155 Miles of Loops

Contracts have been awarded on Trunkline Gas Company's looping expansion project and Mississippi River Transmission Corporation's main line.

Trunkline let contracts for 155 miles of 30-inch loops to Cape Construction Company, Western Pipe Line, Inc., Panama-Williams Corporation, Panama, Inc., and Grayco Constructors. Mississippi's work went to Cape Construction on 94 miles of 18-inch from a point on Trunkline's main line in Clay County, Ill., to St. Louis.

Panama-Williams will lay 40 miles in two loops in Northern Louisiana; Panama, Inc., has two spreads consisting of two 21-mile loops in Louisiana and Tennessee; Grayco will construct 20 miles in Mississippi; Western's spreads include two 21-mile loops in Kentucky and Southern Illinois, and Cape will install a 10-mile section near Effingham, Ill. The new lines will parallel Trunkline's existing main line.

Trunkline recently received authorization on the 155 miles of loops and 69 miles of supply lines in Louisiana. The $25 million project will increase Trunkline's daily capacity to 605 MMcf of gas. Mississippi River Transmission, a subsidiary of Mississippi River Fuel Corporation, will take 50 MMcf from Trunkline. Mississippi received FPC approval on its main line and for storage facilities to cost $9.8 million.

El Paso Gas Supply Co. Files $30 Million Project

El Paso Gas Supply Company has filed an application with the FPC for construction of its $30 million gas line.

The 227-mile, 30-inch line would extend from a point in Live Oak County to its parent company's, El Paso Natural Gas, Sonora plant in Sutton County, Texas. Facilities also would include a 7,000 hp station at the origin of the line and communications, metering and appurtenant facilities. The line would transport about 210 MMcf of gas daily to El Paso Natural. A gathering system is proposed by Coastal States Gas Producing Company's subsidiary, LoVaca Gathering, to supply gas to El Paso Gas Supply.

Pacific Gas Awards River Crossing Contract

River Construction Company has been awarded a contract by Pacific Gas Transmission Company to install two underwater river crossings.

The 36-inch crossings will be buried in the Kootenai and Pend Oreille rivers in Northern Idaho as part of the 1,400-mile Alberta to California gas line. The Kootenai crossing is near Bonners Ferry in Boundary County and Pend Oreille crossing will be at Dover, Bonner County. Length of the Pend Oreille crossing will be 2,320 feet and the Kootenai line will be 1,025 feet. Pipe will have a 0.500-wall thickness.

A contract on the Snake River crossing will be let later; other crossings will be constructed by the prime contractors.

Four Companies Plan 1,000-Mile Propane Line

Four companies are considering building a propane system from the Houston area to southeastern markets and extending to North Carolina.

Union Texas Natural Gas Corporation, Phillips Petroleum Company, Warren Petroleum Corporation and Tuloma Gas Products Company are involved in the proposed project. The $35 million line would have an initial capacity of 25,000 barrels. Preliminary studies have been completed.

This is the second recently announced propane line planned for the southeastern markets. Trans-Southern Pipeline Corporation, a subsidiary of Transcontinental Gas Pipe Line Corporation, will build a 1,335-mile propane system from near Houston to Danville, Va.

FPC Denies Application Of Phillips Rehearing

The Federal Power Commission has denied six applications for rehearing of its September 28, opinion in the landmark Phillips Petroleum Company independent natural gas producer rate case and rejected a seventh application because it was not filed within the time limit.

Applications were filed by Minneapolis Gas Company, the State and the Public Service Commission of Wisconsin, the Michigan Public Service Commission, the Public Service Electric and Gas Company, the State and Public Utilities Commission of California and a group of eastern seaboard distributing companies which intervened in the case.

Trunk Pipeline Ltd. Plans Products Pipe Line

Trunk Pipelines Ltd., proposes to lay a 70-mile products common carrier pipe line from Canvey Island, Essex to Denham, Buckinghamshire. The company has applied to Parliament for permission to construct the line which would include spurs to Purfleet, Fulham and Wandsworth and the London Airport.

The line will travel through London and take established routes to avoid any inconvenience to private land owners. Trunk Pipeline hopes to extend this proposed line northward to the Mersey via Birmingham. It would follow the British waterways Canal System for almost its entire 100-mile length.

Interprovincial Considers Superior to Chicago Line

Interprovincial Pipe Line Company is considering laying a pipe line from Superior, Wis., to the Chicago area to carry natural gas liquids.

The company claims its tariffs would be competitive with any other pipe line that might be proposed to carry liquids from Western Canada fields to Chicago. Foothills Pipe Line proposes to lay a line from Canada to Chicago. Foothills or Interprovincial would take products from one of several proposed gathering systems in Alberta.

Dow Chemical Lets Contract on LPG Line

Dow Chemical Company has awarded a contract to Troy Construction Company for 52 miles of 6-inch LPG line from Markham to Sheridan, Texas.

TGT Subsidiaries File with FPC Seeking Approval for Texas-California Pipe Lines

Three companion applications were filed with the FPC in connection with the proposed $225 million Texas-Mexico-California gas line. Two Tennessee Gas Transmission Company subsidiaries and Southern California Edison Company applied for permission to construct facilities in Texas and California and to export gas at the Texas-Mexico border and import gas at the California-Mexico border.

Tennessee California Gas Transmission Company has applied for a presidential permit to build and operate facilities for exportation of gas from Texas to Mexico. California Gas Transmission Company applied for a similar permit to build and operate facilities for importation of gas from Mexico into California. Both companies are TGT subsidiaries.

Southern California Edison Company, as purchaser of the gas to be transported, applied for authorization to export gas from the United States at Texas-Mexico border and to import the same gas and additional supplies to be obtained in Mexico into the United States at the Mexico-California border near Mexicali.

Tennessee California Gas Transmission would construct 100 miles of 26-inch extending from gas fields in South Texas to the Mexico-Texas border near Reynosa. California Gas Transmission would lay 292 miles of 20-34-inch lines from Mexicali to near Los Angeles and would install 10,000 compressor horsepower.

Petroleum Mexicanos would install the 1,200-mile, 34-inch main line from Reynosa to Mexicali.

Southern California Edison will purchase 455 MMcf of gas daily. Principal suppliers include Humble Oil & Refining Company which will provide 265 MMcf and Pemex which will add at least 75 MMcf.

California Gas Transmission and Southern California Edison also have filed with the California Public Utilities Commission; Tennessee seeking permission to build the line in California and Southern California Edison to import gas from Mexico. The commission has set the hearing on these applications for January 25.

The Pemex main line will also serve domestic and industrial consumers in Mexico along the route of the pipe line.

El Paso-Colorado Interstate Receive Conditional Authorization from FPC

El Paso Natural Gas Company and Colorado Interstate Gas Company received conditional FPC authorization to construct a $150 million project. El Paso will construct its 394-mile, 34-inch line from Provo, Utah, to the California border near Las Vegas. Colorado will lay 500 miles of 26-34-inch and will add a total of 88,880 compressor horsepower in 10 new stations and four existing ones.

Colorado will build a main line extension, 155 miles of 34-inch, from Green River, Wyo., to Provo where it will connect with El Paso. El Paso would deliver 470 MMcf of gas daily to Southern California and Southern Counties Gas companies at the border. A 92-mile, 34-inch line is planned by the California companies to deliver gas to Los Angeles area.

Other new lines to be laid by Colorado include a 109-mile, 26-inch line between its Fourway compressor station and Morton junction in Colorado; a 136-mile, 34-inch line from Morton junction to Devine compressor station east of Pueblo, and a 107-mile, 30-inch line from Devine to Denver.

Colorado's new line will connect with its existing line at Green River, Wyo., where it also would connect with El Paso's existing Northwest Division system. Colorado will take about 235 MMcf of gas from El Paso Northwest system at Green River and supply an additional 235 MMcf to deliver 470 MMcf to El Paso at Provo. Colorado also will deliver an additional 80 MMcf to its Rocky Mountain area increasing its system from 630 to 710 MMcf.

The project is conditional upon approval of the California line by Public Utilities Commission.

Jack S. Gray, President

R. D. Sheehan, First V.P.

James W. Sharman, Second V.P.

E. G. Morrison, Treasurer

Gardiner Symonds, Speaker

George E. Perrine, Speaker

Morris Frank, Speaker

Richard A. Gump, Exec. Secretary

PLCA Annual Convention January 15-18

The thirteenth annual Pipe Line Contractors Association meeting will be held in San Francisco at the Fairmont and Mark Hopkins Hotels, January 15-18.

Guest speakers for the convention include Gardiner Symonds, chairman of the board, Tennessee Gas Transmission Company; George E. Perrine, Illinois Commerce Commissioner and Morris Frank, columnist of the Houston Chronicle.

At the meeting new officers and directors for 1961 will be elected. Sessions will include discussions on labor matters and reports of various association committees.

January 14

6:00 p.m. —President's Party for Officers, Directors, Past Presidents, Honorary Members, and Special Guests. Cocktails and Dinner, Hunt and California Rooms, Fairmont Hotel.

January 15

3:30 p.m. —Nominating Committee Meeting, President's Suite, Fairmont Hotel.

4:30 p.m. —Board of Directors' Meeting, Hunt Room, Fairmont Hotel.

6:00 p.m. —Reception - Venetian Room, Fairmont Hotel. Courtesy Big Three Welding Equipment Company, Houston.

7:30 p.m. —Buffet Dinner-Gold and Nob Hill Rooms, Fairmont Hotel. Courtesy H & L Tooth Company, Montebello, Calif.

January 16

7:30 a.m. —Early Birds' Breakfast-Peacock Court, Mark Hopkins Hotel Courtesy Insley Manufacturing Corporation, Indianapolis, Ind.

8:00 a.m. —Registration begins for Gin Rummy Tournament - Fairmont Hotel. Sponsored by Polyken Sales Division, The Kendall Company, Chicago.

9:30 a.m. —General Business Meeting-Terrace Room, Fairmont Hotel

1. Call to order and welcoming address, Jack S. Gray, president.
2. Address by Gardiner Symonds, Chairman of the Board, Tennessee Gas Transmission Company, Houston, Texas.
3. Address by George R. Perrine, Chairman, Illinois Commerce Commission, Chicago, Illinois.

12:00 Noon —Luncheon for the Ladies-Alta Mira, Sausalito, California. Courtesy Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin.

12:00 Noon —Luncheon for the Men-Room of the Dons and Peacock Court-Mark Hopkins Hotel, Courtesy Crose - Perrault Equipment Corp., Tulsa.

2:00 p.m. —Gin Rummy Tournament begins-Hunt & California Rooms, Fairmont Hotel.

10:00 p.m. to 2:00 a.m. —Cabaret-Cafe du Chat, Fairmont Hotel. Courtesy Caterpillar Tractor Co., Peoria, Ill.

January 17

9:30 a.m. —General Business Meeting-Terrace Room, Fairmont Hotel

1. Jack S. Gray, President, presiding.
2. Report of Executive Secretary-Richard A. Gump.
3. Address by Morris Frank, The Houston Chronicle, Houston, Texas.
4. Presentation of safety awards.

11:00 a.m. —Closed Business Session for Regular Members Only-Terrace Room, Fairmont Hotel

1. Jack S. Gray, President, presiding.
2. Reports of Committees.
3. Election of Officers and Directors.

12:00 Noon —Luncheon and Show-Gold and Nob Hill Rooms, Fairmont Hotel. Courtesy Crutcher - Rolfs - Cummings, Inc., Houston.

2:00 p.m. —Gin Rummy Tournament continues-Hunt and California Rooms, Fairmont Hotel.

6:00 p.m. —Reception-Venetian Room, Fairmont Hotel. Courtesy International Harvester Company, Chicago, and Superior Equipment Company, Bucyrus, Ohio.

7:30 p.m. —Annual Banquet and Floor Show-Gold and Nob Hill Rooms, Fairmont Hotel.

January 18

8:00 a.m. —Breakfast Meeting of New Board of Directors-Hunt Room, Fairmont Hotel.

9:30 a.m. —Meeting of Regular Members Only-Nob Hill Room, Fairmont Hotel (discussion of labor matters).

PROPOSED PIPE LINE CONSTRUCTION

Here in convenient summary form is Pipe Line Industry's listing of company, line size, length, service, location and project status.

U.S.

Algonquin Gas Transmission Co., Boston, 25 miles, 20-inch; 8 miles, 8-inch, gas, and 12,000 hp addition in Massachusetts, $6 million, before FPC.

Arkansas Louisiana Gas Company, Shreveport, La., 58 miles, 2-6-inch, gas, planned.

Belle Fourche Pipeline Co., Casper, Wyo., 103 miles, 8-inch, crude, Fiddler Creek field to Lance Creek, Wyo., and branch lines from North Donkey Creek field to Rozet and Miller Creek fields, $2¾ million, approved by Wyoming Public Service Commission.

Border Gas Transmission Company, 300 to 400 miles, gas, gathering, in South Texas, $10 million, planned.

California Gas Transmission Company, Los Angeles, (subsidiary of Tennessee Gas Transmission Company), 292 miles, 20-34-inch gas, from Mexico-California border near Mexicali, to Los Angeles and 10,000 hp. to tie into Texas Mexico-California line, $50 million, before FPC and California Public Utilities Commission.

Carolina Pipeline Company, Columbia, S. C., 85 miles, 8-inch, gas, in South Carolina, $5 million, before FPC.

Coastal States Gas Producing Co., Corpus Christi, Texas, 60 miles, 10-inch, gas, gathering, La Salle and Frio counties, Texas, before FPC.

60 miles, small diameter, gas gathering line, to tie in with system under construction and extend to Pearsall County, Texas, planned.

25 miles, gas, Associated Gas & Oil Co. field to South-Tex Corp., processing plant west of Corpus Christi, Texas, planned.

Coastal Transmission Corp., Houston, 81 miles, 3 to 10-inch, gas, laterals; 5,500 hp in stations at Port Lavaca, Texas, and Eunice, La., and additional 1,500 hp at Robstown, Texas, $6.2 million, FPC authorization.

Colorado Interstate Gas Co., Colorado Springs, 140 miles, 34-inch, gas, Green River, Wyo.,-to-Provo, Utah; 109 miles, 26-inch, Texas Panhandle to southeastern Colorado, 136 miles, 34-inch, southeastern Colorado-to-Pueblo, Colo.; 107 miles, 30-inch, Pueblo-to-Denver, $91 million, FPC conditional authorization.

Colorado Oil & Gas Corp., Denver, 400-miles, gas, from Cubik field to Fairbanks, Alaska, planned.

East Coast Pipeline Co., 90 miles, 12- to 24-inch, products, Linden, N. J. to Suffolk County, New York, $25 million, planned.

El Paso Gas Supply Company, El Paso, Texas, 228 miles, 30-inch, gas, main, Live Oak to Sutton County, Texas, $30 million, before FPC.

El Paso Natural Gas Company, El Paso, 199 miles, 30-inch, Permian-San Juan crossover loop, before FPC.

17 miles, from Pacific Gas Transmission Co. facilities to near Spokane, Wash., before FPC.

34 miles, 20-inch, Puckett to Goldsmith, before FPC.

23 miles, 20-inch, Goldsmith to Eunice-Plains line, before FPC.

9 miles, 20-inch, Goldsmith-Plains loop, before FPC.

43,600 hp in new and existing stations in Texas, Oklahoma, New Mexico and Utah, before FPC.

400 miles, 34-inch, Salt Lake City, Utah, to California border, FPC conditional authorization.

El Paso Natural Gas Products Company and **El Paso Products Pipeline Co.**, 32 miles, 6-inch, crude, from Patrick Draw Oil and Gas Field to Wamsutter, Sweetwater County, Wyoming, before Public Service Commission.

Equitable Gas Company, Pittsburgh, Pa., 31 miles, 16-inch, and 26 miles, 20-inch, in West Virginia and Pennsylvania, $5 million, before FPC.

Great Northern Railway, St. Paul., 110 miles, crude, fields in Burke and Bottineau counties to Minot, N. D., $3½ million, contract let on 50 miles to **Curran and Company.**

Hope Natural Gas Company, Clarksburg, W. Va., 20 miles, 20-inch, gas, in Lewis, Ritchie and Pleasants counties, W. Va., $2 million, FPC authorization.

Houston Texas Gas & Oil Corp., St. Petersburg, Fla., 199 miles, 2 to 6-inch, gas, laterals; 20,000 hp in five new stations; $12 million, before FPC.

Iron Ranges Natural Gas Co., 115 miles, gas, from Itasca and St. Louis counties along route of Mesabi range from Grand Rapids to Aurora, Minn., $5 million, FPC authorization.

60 miles from Duluth to Silver Bay, Minn., FPC authorization.

Kansas-Nebraska Natural Gas Company, Hastings, Neb., 165 miles, 2-8-inch, gas, extension from Alliance, Neb., to Chadron, Crawford, Hemingford, Hay Springs, Gordon and Rushville, Neb., before FPC.

45 miles, 2-3-inch, gas, in Kansas, approved by Kansas Corporation Commission.

2,000 hp addition at Scott City, Kan., FPC approval authorization.

2,500 hp addition at Holcomb, Kan., before FPC.

Lone Star Gas Company, Dallas, 52 miles, 18-inch, Springtown to Gordon, Texas, planned.

47 miles, gathering lines in Palo Pinto, Erath and Stephens counties, Texas, planned.

Lo-Vaca Gathering Co., 230 miles, 6-20-inch, gas, gathering, Live Oak to Lavaca County, Texas, planned.

Matador Pipe Line Corp., Denver, 175 miles, crude, from Bottineau, Burke and Renville counties, N. D., to Cromer, Man., Canada, $4 million, proposed.

Michigan Wisconsin Pipe Line Co., Detroit.

37 miles, 6 and 12-inch lateral loops in Wisconsin, before FPC.

29 miles, 30-inch, loops, Illinois, Indiana, and Michigan, 3,000 hp. station, Janesville, Wis., before FPC.

Two 2,000 hp units at Meade, Kansas; one 2,000 hp unit at Havensville, Kansas, before FPC.

Mid-America Pipe Line Co., 405 miles, 10-inch, LPG, Superior, Wis., to Chicago, $12 million, considered.

Natural Gas Pipeline Company, Chicago, 62 miles, gas, pipe line and various river crossings, FPC authorization.

New Haven Pipeline, Inc., products line, New Haven, Conn. to Springfield, Mass., $2.5 million, planned.

Niagara Mohawk Power Corp., 122 miles, 12-inch, Watertown and Massena, N. Y., contract let to Fulghum Contracting Corporation pending FPC approval.

Northern Natural Gas Company, Omaha, Neb., 236 miles, gas, in Kansas, Nebraska, Iowa, Illinois and Wisconsin and 14,050 hp, $25 million, before FPC.

124 miles, in Oklahoma, Kansas, Nebraska, Iowa, and Minnesota and 17,360 hp, $17 million, before FPC.

22 miles, in Iowa, $673,100, before FPC.

Northwestern Refining Co., crude gathering system, Rival and Lignite fields, North Dakota, $625,000, Public Service Commission approval.

Ohio Fuel Gas Co., 59 miles, gas, 4-24-inch main lines, in Belmont, Carroll, Cuyahoga, Fairfield, Logan, Lorain, Marion, Muskingum, Stark and Wayne counties, Ohio, $5.1 million, planned.

Panhandle Eastern Pipe Line Co., Kansas City, 305 miles, 30-inch, 40 miles, 26-inch, gas, loops, and 43,000 hp, and gathering facilities, $60 million, before FPC.

200 miles, 22-24-inch, gas, lateral, from Elk City, Okla., to Haven, Kan., before FPC.

Pan American Gas Company, Tulsa, 50 miles, 12-inch, gas, La Porte to Pasadena to Texas City, Texas, planned.

Peoples Gas Light & Coke, Chicago, 29 miles, 36-inch, gas between North Shore and Calumet stations, planned.

Peoples Gulf Coast Pipeline Company, Chicago, 27 miles, gas and turbocharger additions to 71 compressor engines, befor FPC.

Rio Gas Gathering Co., San Antonio, 97 miles, 3 to 8-inch, gas gathering, South Texas, to supply gas to El Paso Natural Gas Company, planned.

Southern California and Southern Counties Gas Cos., Los Angeles, 93 miles, 34-inch, California-Nevada border to Newberry, Calif.

St. Lawrence Gas Company, Inc., Ogdensburg, N. Y., 75 miles, gas, main, United States-Canadian border to Og-

densburg, N. Y., $3.4 million, FPC examiner approval.

Tennessee California Gas Transmission Company, (subsidiary of Tennessee Gas Transmission Co.), 100 miles, 26-inch, gas, gas fields in South Texas to Texas-Mexico border near Reynosa, before FPC.

Tennessee Gas Pipeline Co., Houston 191 miles, 30 and 36-inch loops, in Ohio, Pennsylvania and New York, 72 miles of gathering lines and 43,600 hp in five stations, $46 million before FPC.

158 miles, 36-inch, gas, loops in Mississippi and Louisiana, FPC authorization.

21 miles, 16-inch, 2 miles, 12-inch, gas, Louisiana coast, Vermilion blocks 16 and 64, $3 million, before FPC.

50 miles, 10-16-inch, gas, offshore Louisiana, FPC authorization.

Texas Eastern Transmission Corp., Shreveport, La.

66 miles, 30-inch, gas, loops, between Vidor, Texas, and Lambertville, N. J., and 33,710 hp in four existing stations, $17.5 million, temporary FPC authorization.

Extension of products line from Lebanon, Ohio, to Elmira, N.Y., considered.

350 miles, 24-inch, coal slurry, West Virginia to New York, considered.

Texas Gas Transmission Corp., Owensboro, Ky., 96 miles, 26-30-inch, gas loops, Louisiana, Arkansas, Mississippi, Tennessee, Kentucky and Indiana; 50 miles, 8 and 16-inch extension into Terrebonne, La. producing area, $16.8 million, before FPC.

Transcontinental Gas Pipe Line Corporation, Houston.

211 miles, 36-inch, and 69 miles, 30-inch, loops and additional 32,040 hp, in Texas, Louisiana, Mississippi, Alabama, Georgia and South Carolina, $52 million, FPC examiner approval.

13 miles, 24-inch and 18 miles, 20-inch loops, Louisiana, FPC authorization. 14 miles, 16-inch laterals, 1-mile, 12-inch lateral, Louisiana, $2.1 million, FPC authorization.

29 miles, 20-inch, gas, and 2,500 hp, in South Texas to take gas from South Texas Natural Gas Gathering Co., $2.4 million, FPC authorization.

Trans-Southern Pipeline Corp., Houston, 1,080 miles, 12-inch, LPG, from Mont Belvieu, Texas, to Danville, Va., and 215-mile spur line from Atlanta to Georgia-Florida border, $63 million, planned.

Trunkline Gas Company, Houston, 252 miles, 30-inch loops, and 140 miles, laterals, between Longville, La., and Tuscola, Ill., $45 million. Contracts let on 155 miles to Cape Construction, Western Pipe Line, Panama-Williams, Panama Inc., and Grayco.

Underground Storage & Exploration, Upper Darby, Penn., 394 miles, 12-inch LPG, from Moundsville, W. Va. to Newark, N. J., $9 million, approved.

95 miles, 6-8 inch, laterals to Mauch Chunk, Penn., and to Philadelphia, planned.

United Gas Pipe Line Co., Shreveport, La., 59 miles, 36-inch, gas, lateral between Bastian Bay field and Plaquemines Parish, La., before FPC.

Union Texas Natural Gas Corp., (joint project with Phillips Petroeum Co., Warren Petroleum Corp. and Tuloma Gas Products Co.) 1,000 miles, LPG, Houston to North Carolina, $35 million, planned.

Valley Gas Transmission, Inc., Houston, 55 miles, 3 to 8-inch, gas, gathering, in Hidalgo, Brooks, Starr and Jim Wells counties, Texas, $15 million, before FPC.

West Shore Pipe Line Co., 250 miles, 10-16-inch, products, East Chicago, Ind., to Green Bay, Wis., planned.

International

ACT Oils, Ltd., Montreal, 400 miles, crude, Dawson Creek, B. C., to Bella Coola, B. C., before B. C. government.

Ajax Alberta Pipeline Ltd., 28 miles, 10-inch, gas, main, Morinville to Westlock, Alta., planned.

Assistencia de Oleodutos du Petrobras, Rio de Janeiro, 280 miles, 12-inch, crude, Rio de Janeiro to Belo Horizonte, Brazil, planned.

Abu Dhabi Marine Areas Ltd., (British Petroleum Co. and Compagnie Francaise Des Petroles) 20 miles, 18-inch, crude, from Umm Shaif offshore oilfield to Das Island, Persian Gulf, planned.

Barnabos Group (Italian Interests), crude line from Venice, Italy, to Insbruck, Austria, with extension to Munich, Germany, planned.

Bituminous Oil Pipeline Co., Calgary, 250 miles, crude, from Athabasca tar sand plant in northeastern Alberta to Edmonton, approved.

British American Oil Co., Ltd., Toronto, 125 miles, gas, Pincher Creek fields to Calgary, Alta., before Alberta Public Utilities Board.

Burmah Oil Co., Ltd., 850 miles, crude, 20 inch, from Nahorkativa to Calcutta, India. Contract let on 250 miles to **Mannesmann-Saipem.**

Cartier Gas Corp. (St. Maurice Gas, Inc., and Consumers Gas Co., Toronto), 170 miles, gas, Montreal to Quebec City, planned.

Consolidated Gathering Systems, Ltd., Calgary, 198 miles, crude, Sturgeon field to Edmonton, planned.

Foothills Pipe Lines Ltd., 1,300 miles, LPG, from Alberta-Saskatchewan border to Chicago, tie-in with Westalta Products Pipeline proposed system in Alberta, $100 million, before Alberta Board of Public Utilities Commissioners.

Gas del Estado, Buenos Aires, 1,050 miles, 30-inch, gas, Comodoro Rivadavia field to Buenos Aires, $380 million, bids submitted for design and construction by Texas Eastern Transmission Corp., ENI, and an Argentine firm.

Gas Trunk Line of British Columbia, Vancouver, 250 miles, 30-inch, gas, main, Fort Nelson to Taylor, B. C., planned.

Gases Naturales de Colombia, S.A., 140-mile, 10-inch, gas, Cicuco field to Barranquilla, Colombia, planned.

Hughenden Pipeline, 125 miles, products, Dick Lake gasoline plant to Hughenden Region, Alta., planned.

Hydrocarbons Pipeline, Ltd., Winnipeg, Manitoba, 880 miles, 6-8 inch, products, from Edmonton to Winnipeg, $35 million, partial authorization.

Independent Pipe Line Co., 2,019 miles, 34-36-inch, crude, Edmonton to Montreal, 23,000 pump horsepower, $395 million, before Borden Commission.

Interprovincial Pipe Line Company, 350-mile extension from Toronto to Montreal, looping line from Edmonton to Toronto, crude, $240 million, considered, products pipe line, Superior, Wis., to Chicago, considered.

Mid-Continent Pipe Lines, Ltd., 1500-mile, 30-inch crude, Edmonton to Chicago, planned.

Naphtha Israel Oil Co., 75 miles, 6-inch, gas, Rosh-Zohar field to Ashdod Yam on Mediterranean planned.

National Iranian Oil Co., 146 miles, 6 inch, crude, from Azna to Isfahan, Iran, $5 million, planned.

Northern Alberta Pipe Lines, Ltd., Edmonton, Alta., 110 miles, 10-inch, gas, main, Lac La Biche to Edmonton, $3 million, planned.

Northern Pipe Line Company, 153 miles, 16-inch, crude, from Regina, Saskatchewan, to Clearbrook, Minn., $10 million, planned.

Oasis Oil Co., of Libya, (Amerada, Continental and Ohio Oil Company), 86 miles, 30-inch, Dahra field to Es Sider, Libya; 36 miles, 20-inch, Mabruk to point between Es Sider-Dahra, before Libyan Petroleum Commission.

Peace River Oil Pipe Line Co., Ltd., 70-mile, crude, Swan Hills to Iosegun Junction, approved.

Pembina Pipe Line, Ltd., Edmonton, 1,200 miles, LPG, from Alberta gas fields to eastern Canada, planned.

Petroleos Mexicanos, 4, 6 and 8-inch, products, Mexico City-Puebla to Cuernavaca, planned.

1,240 miles, 34-inch, gas, Reynosa to Mexicali, Mexico $160 million, negotiating with Tennessee Gas Pipeline Company for design and construction of the line.

8-inch, products, and 12-inch, gas Torreon to Chihuahua, underway.

360 mile, 12-inch, products, Minatitlan to Puebla and Mexico City, construction to start in 1960.

Products, Guadalajara to Tepic, planned.

Products, Aguascalientes to Zacatecas, planned.

6-inch, products, Guaymas to Ciudad Obregon, considered.

8-inch products, Guaymas to Hermosillo, considered.

8-inch, gas, Tierra Blanca to Veracruz, to be built in 1960.

14-inch, gas, Mexico City to Salamanca, underway.

Gas, Ciudad Carmen to Ciudad Pemex.

8-inch, crude Comalcalco to Minatitlan, to be built in 1960.

Crude, Minatitlan to Salina Cruz, contingent on proposed refinery on Pacific Coast.

149 miles, 10-inch, products, Ciudad Pemex to Minatitlan, planned.

181 miles, 4-inch, products, Mexico City to Salamanca, planned.

Pipelines of Puerto Rico, Inc., 95 miles, 8-inch, products, Penuelas to San Juan, Puerto Rico, approved.

Provincial Pipe Lines, Ltd., 700 miles, 3-16-inch, hydrocarbon line gathering system in Alberta, $25 million, before Alberta Oil and Gas Conservation Board.

Qatar Petroleum Company, Qatar, 60 miles, 6-10-inch, gas, Dukhan to Doha, Qatar, engineering contract let to Pencol Pipeline & Engineering Consultants.

Quebec Gas Transmission Lines, Inc., Montreal, 300 miles, gas, main, Quebec to Montreal, planned.

Rangeland Pipe Line Company Limited, 111 miles, 8-inch, crude, southeastern Alberta to Calgary, $3 million, planned.

Saskatchewan Power Corp., 179 miles, 4-6-8-inch, gas, planned.

Societa Nazionale Metanodotti, 650 miles, 18-inch, crude, Genoa, to Milan-Cremona-Torino, Italy, and Aigle, Switzerland, with extensions to Karlsruhe and Munich, Germany, planned.

Societe d'Etude du Pipe Line Sud-European, Paris, 419 miles, 30-inch, crude, port of Lavera to Strasbourg, with lateral extending 40 miles to Karlsruhe, Germany, approved by French cabinet.

Soc. Siciliana Metanadotti, gas line from Hassi R'Mel field in Algeria through Tunisia, across Mediterranean to Sicily and into Italy, considered.

SN Repal, Paris, France, 180 miles, 8-inch, gas condensate, Massi R'Mel to terminal on Hassi Messaoud to Bougie line in Algeria, planned for 1961.

Standard-Vacuum Oil Company, 60 miles, 8-inch, gas, main, in South Sumatra, considered.

Ste. d-Etudes de Pipeline Intercontinetaux, Paris, 1,400 miles, 30-40-inch, gas, from Hassi R'Mel field in central Algeria across Mediterranean, through Spain, France and into West Germany, considered. Fish International Corporation making engineering and feasibility studies.

Sui Gas Transmission Co., Multan, Punjab, India, 145 miles, 8-inch, gas, from Sylhet to Dacca, East Pakistan, $9 million, considered.

130 miles, 16-inch, gas, main line, Multan to Lyallpur, planned.

Syrian Pipeline, Damascus, 500 miles, crude, from Karshuk field, Syria, to Mediterranean, planned.

300 miles, products, from Homs to tank farms in Damascus, Aleppo and Latakia, planned.

Trans-Canada Pipe Lines Limited, Toronto.

268 miles, 34-inch, loops, and additional hp planned for 1961, $69 million.

122 miles, 34-inch, loops, hp additions, $46 million, planned for 1962.

Trans-Prairie Pipelines, Ltd., Edmonton, crude line, from Weyburn field to Regina-Moose Jaw areas, $5 million, considered.

Trunk Pipelines Ltd., London, 70 miles, products, Canvey Island to Denham, Buckinghamshire, bill before Parliament. Extension of line from Denham to Birmingham, planned.

Westalta Products Pipeline Ltd., 900 miles, LPG, from Northern Alberta to Saskatchewan border, to deliver hydrocarbons to Foothills Pipe Lines, $40 million, before Alberta Board of Public Utilities Commissioners.

Williams-McWilliams Industries, Inc., New York, 441 miles, 6-inch, crude, Villa Montes, Bolivia, to Villa Hayes, Paraguay, considered.

Westcoast Transmission Company, 688 miles, 30-inch, gas, loops, Peace River area of British Columbia, to United States border, planned.

Texas Eastern Receives Approval for Loop Lines

Texas Eastern Transmission Corporation has received temporary authorization from the FPC for construction of its $17 million looping project. Also Algonquin Gas Transmission Company was granted approval for a 6,000-hp station project costing $2 million.

Texas Eastern will lay 66 miles of 30-inch loops between Vidor, Texas, and Lambertville, N. J., and will install 33,710 compressor horsepower in four existing stations. The new facilities will boost Texas Eastern's capacity 51 MMcf of gas daily.

Natural Gas Pipeline Receives FPC Approval

Natural Gas Pipeline Company of America has received Federal Power Commission temporary approval for construction of about 87 miles of 6-10 and 20-inch lateral lines. One project includes 50 miles of 20-inch and 4 miles of 6-inch lateral supply in South Texas. The other project consists of 33 miles of 10-inch in Refugio, Texas.

Lone Star Gas Company Plans 52-Mile Pipe Line

Lone Star Gas Company will lay a 52-mile, 18-inch gas line from its Springtown gasoline plant to Gordon gasoline plant in Texas. From Springtown it will run across Parker and Palo Pinto counties to Gordon.

Lone Star also plans to construct 47 miles of gathering lines in West Central Texas counties of Palo Pinto, Erath and Stephens. The system will provide an outlet for some 37 wells recently completed in this area.

Continental Pipe Line Laying 10-Mile Pipe Line

A contract for construction of a 10-mile line from Rayne, La., has been awarded to Texas Pipeline Construction Co., by Continental Pipe Line Company.

ON THE LINE

Testing Schools

Curtiss-Wright Princeton Division announces that the Non-destructive Testing Department's next course in Industrial Isotope Radiography will be given at its non-destructive testing laboratories in Princeton, N.J., January 30-February 3.

Also the Department will conduct its Ultrasonic Inspection Techniques course at the same place January 23-27.

For further details write or call Mr. Bruce W. Smith, Curtiss-Wright Corporation, Box 110, Princeton, N.J., SW-9-0500.

Short Course Discontinued

The Southern Gas Association has discontinued the short course in gas technology offered each spring at Texas A & I College in Kingsville, Texas.

"Because of changes within the industry which the short course itself helped to bring about, and the fact that the functions performed by the course are now being served by other SGA activities, the special committee found there no longer was need to offer the course," James A. Wilson, SGA president said.

Gas Turbine Conference

The sixth annual Gas Turbine Conference and Products Show sponsored jointly by the Gas Turbine Power Division of the ASME and the United States Department of Defense will be held in Washington, D. C., March 5-9 at the Shoreham Hotel.

Papers and discussions will cover the gas turbine fields of aircraft, automotive fuels and combustion, industrial, marine, nuclear, rail and central station power plants.

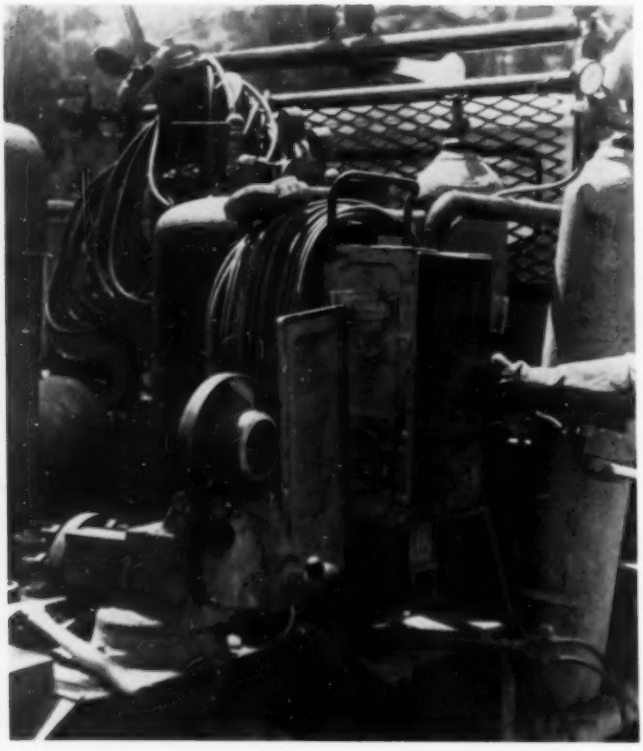
Among operating exhibits are expected to be vehicles powered by gas turbines, turbine driven marine craft and turbo water pumps.

Registration may be made in advance or at the hotel starting Sunday March 5, from 3 p.m. to 6 p.m. Advance programs may be requested from the ASME, Meeting Department, 29 West 39th Street, New York 18, N. Y.

How to do it

PIPE LINE HINTS

$10 is paid for each illustrated acceptable contribution. Mail to The Editor, PIPE LINE INDUSTRY, P. O. Box 2608, Houston 1, Texas



Ammo Box Provides Good Welding Rod Compartment

Here's the way one welder solved the problem of transporting welding rods. He bought a World War II ammo box at any army surplus store; divided it into six compartments by tacking welding rods to the inside and stored various sizes of rods he will need on the job.

As shown here, he welded a short piece of ¾-inch hog rod to the back of the box so it can serve as a rack for welding cable. For traveling to and from the job, buckle the lid onto the box.

Here's the Deluxe Pipe Frame for a Pickup Truck

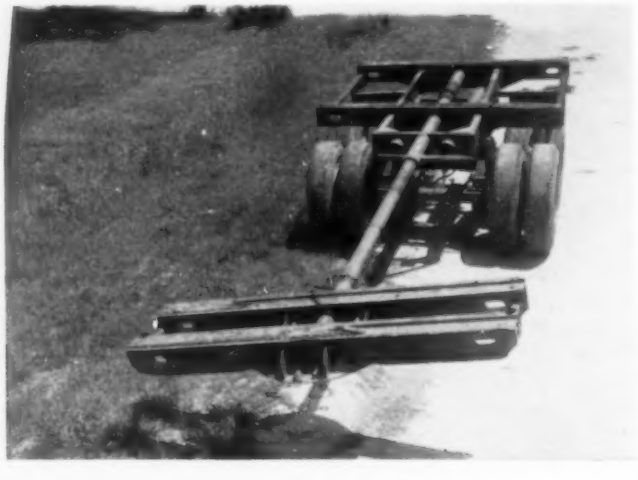
Many's the pipe frame that has been added to a pickup truck to enable pipeliners to haul small diameter pipe. But here is the deluxe pipe frame which has every advantage but the built-in kitchen stove.

The frame is made to bolt to the truck at the four corners—additional support is provided with bearing pads over the interior fenders.

Note that the back cross-piece is attached to the upright members with unions. When the driver needs to remove this part, he simply loosens the unions and then attaches the crosspiece to unions on top of the frame above the cab. This cross-member is shown in both positions in the accompanying photo.

When the location of the cross-member is changed, companion pieces with unions are also changed as shown.

To make the corner pieces, cut triangular pieces of ⅜-inch steel plate which will fit the corners. Weld the pipe to them and add gusset plates to two sides of each vertical member for bracing.



Modify Pole Trailer to Use it With Truck Tractor

To modify an ordinary pole trailer to use it with a truck tractor which has a fifth wheel, weld a double bolster to the pole as shown with a bearing plate underneath. The pin which fits into the fifth wheel on the tractor is welded to the plate.

This arrangement lets the tractor support its portion of the pipe load.

Tires Prevent Damage from Blasting in Close Quarters

Old tires have found more uses in the United States than perhaps any item of discard. There are some who say the offshore oil industry would have to shut down were it not for the plentiful supply of tires which are used for bumpers for barges, etc.

Here's another use for discarded tires. Simply interpose a cluster of them between a blast and a structure which must be protected. The tires absorb and reflect a good portion of the shock waves and have proved effective in preventing damage to relatively easily damaged sewer pipe, etc.

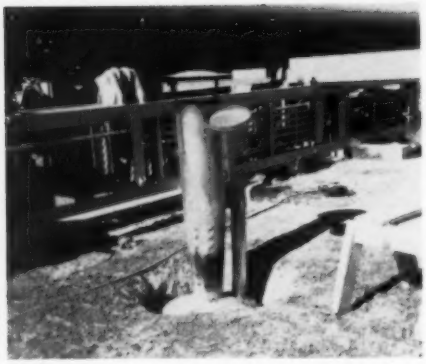
The tires are backfilled prior to the explosion.

Span the Pipe Line Ditch With a Line Pipe "Culvert"

This is the time of year when pipeliners in many sections of the country are battling mud and water. Shown here is an effective trick which can be used to transport water from a roadside ditch over the pipe line ditch beneath it. Simply lay a joint of line pipe across the pipe line ditch, fill in around the ends and let the drainage ditch water flow through it. Once water has subsided or the pipe line has been backfilled, remove the line pipe.

Doubling Up Machines Speeds Firing Line Welding Progress

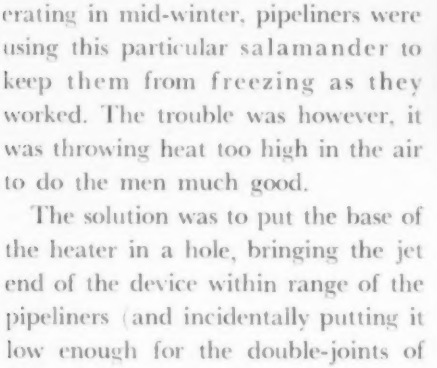
Why not haul two firing line welding machines on the same trailer? The objection in the past has been that one welder would be waiting for the other. But one contractor found that waiting time more likely came from waiting on a tow tractor; so in this instance, the company doubled up on the welding machines, cutting back on the tow tractors. Judging by the progress the contractor made on the Midwestern job, the welders might have spurred one another on.



Heater too High? Put it in a Hole

As most pipeliners know, this particular space heater is a salamander—and given half a chance it can thaw the hinges of hell! In New Mexico, where a double jointing yard was operating in mid-winter, pipeliners were using this particular salamander to keep them from freezing as they worked. The trouble was however, it was throwing heat too high in the air to do the men much good.

The solution was to put the base of the heater in a hole, bringing the jet end of the device within range of the pipeliners (and incidentally putting it low enough for the double-joints of pipe to roll over it). How did it work out? Everybody's warm and cozy and the pipe rolls on despite the below freezing temperatures.



Piece of Pipe Protects Faucet From Vehicles

If you want to be strictly correct, call it a "hose bib"—not a faucet. But regardless of what you call it, if it extends outside a building where trucks park, it will take a beating if it is not protected.

One way to protect a "hose bib" is shown here. Cut a short piece of 12-inch pipe in half, weld lugs to it and drill bolt holes. Using a star drill, punch four holes in the masonry wall to match, install "expansive" shields (sometimes called "expansion" shields) and the hose bib is safe. Cut a hole in the pipe for the hose and paint the guard a bright color to warn off truck drivers.

Scrap Pipe Makes Guard For Meter Installation

It is better to build one meter guard than to curse the truck drivers who otherwise knock it down. This particular meter installation was knocked out twice in one winter and this led to construction of the guard shown here.

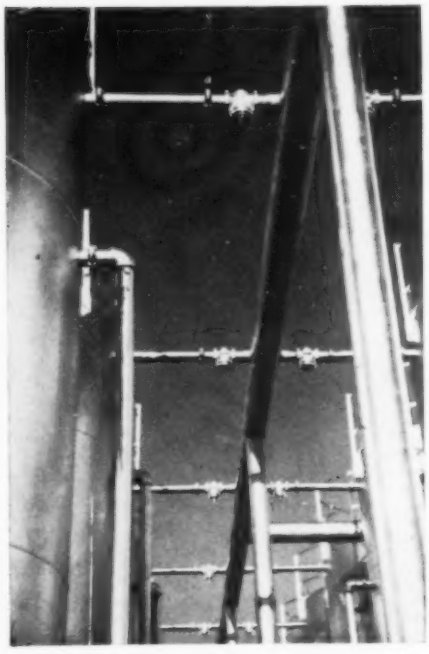
It is made of 2-inch pipe—the risers are imbedded in concrete; the protective member is braced against the building.

Build a Truck Boom With Hydraulic Jack

A lifting device built around a hydraulic jack mounted in the right rear corner of the bed of a truck can be useful when disassembling or assembling heavy equipment or loading equipment on the truck.

The top of the jack is bolted into a clevis on the bottom of a boom made from a 2-inch pipe. The bottom of the jack is bolted to a plate on top of a piece of 1½-inch pipe which rests in a well fastened in the corner of

the pickup. At the business end of the lift, two bars are attached to the outer end of the base plate and hinged to the 2-inch boom to provide the "lift" when the jack is extended. A hook is fastened to the lifting end of the boom. The boom can be hooked to the side of the truck bed when not in use.



Long-Handled Tee Wrench Operates Elevated Valves

When valves are installed in elevated positions where a walkway cannot be used, the valves can be installed in an inverted position and manipulated from the ground with a long-handled tee wrench.

Except for the lubrication of plug valves, all climbing for the operation of the valves is eliminated by this method of installation.

What's Happening

among MEN in the INDUSTRY

Stephen D. Bechtel, Jr., has been elected president of **Bechtel Corporation.** His election marks the third generation of leadership in the Bechtel Corporation, started by **W. A. Bechtel.** Stephen Bechtel succeeds **S. D. Bechtel, Sr.**

S. D. Bechtel, Jr.

The new president has been with the company since 1948, when he was appointed a field engineer. He held various positions, job engineer, assistant superintendent and superintendent before taking over management of pipe line operations in the United States and Canada in 1952 as a vice president. In 1955, he was made senior vice president and director of Bechtel Corp., and later became chairman of Canadian Bechtel Limited. In 1959, he was named chairman of the company's executive committee.

Donald L. Connelly, director and senior vice president of **Warren Petroleum Corp.,** has been named president of the Mid-Continent Oil and Gas Association. **Harold Decker,** president of **Highland Oil Company,** was named first vice president; **Joe T. Dickerson** was re-elected executive vice president, and **Clarel Mapes** was renamed secretary-treasurer.

Eskil I. Bjork, chairman and chief executive officer of the **Peoples Gas Light and Coke Company,** will retire March 1. He will continue as a director and serve as chairman of the executive committee. **Remick McDowell,** president and a director of Peoples Gas, was elected to succeed Bjork, and **Leslie A. Brandt** will assume McDowell's position. Brandt is comptroller and a vice president.

Ward C. McCallister, assistant comptroller, will succeed Brandt as comptroller and become a vice president. **Wilfred G. Pilgrim** will be assistant vice president, continuing as assistant comptroller. **Elmer F. Schuldt,** chief operating engineer, is to succeed **John J. Novy** as assistant vice president, operation division, effective February. **Allan J. Good** will be promoted from treasurer to assistant vice president, finance and public relations division. Replacing Good will be **William H. Hollweg,** assistant secretary and assistant treasurer. **Edwin M. Taber,** now assistant treasurer and assistant secretary, will become secretary and continue as assistant treasurer. Taber will assume one of two positions filled by **Robert M. Drevs,** vice president, finance and public relations.

Bjork joined Peoples Gas in 1920 as a ledger clerk. In 1941, he became a vice president and in 1952, was elected president. In 1957 he was named chairman and chief executive officer in 1957. McDowell joined the company in 1940 as executive assistant to the secretary. He became executive vice president in 1957, and president in 1960.

Harry Moreland, president, **Great Lakes Pipe Line Company,** was elected president of the Pipe Liners Club at the annual API meeting. **J. W. Emison,** president, **Texas Pipe Line Company,** was named vice president and **Oliver C. Klinger, Jr.,** *Pipe Line News,* was re-elected secretary-treasurer.

Moreland served as a vice president last year and succeeds **L. H. True, Magnolia Pipe Line Company** president. **J. L. Irvin,** president of **Gulf Refining Company,** and **Earl Unruh,** president of **Sinclair Pipe Line Company,** were named to the board of governors.

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W. J. Bowen, Sr.

J. French Robinson

The Houston Corporation has elected **W. J. Bowen, Sr.**, president, and named **Leon M. Payne** secretary and chief counsel. **J. French Robinson** has been appointed chairman of the executive committee

Leon M. Payne

Bowen, a director and vice president of the corporation since 1958, also serves as president and director of **Coastal Transmission Corporation** and **Houston Texas Gas and Oil Corporation,** subsidiaries of The Houston Corporation. Payne has been serving as a director, and Robinson is the former chairman of Consolidated Natural Gas Company.

Robert N. Curry has been named assistant superintendent of dispatching for **Texas Gas Transmission Corporation.** He will assist superintendent **I. P. Robinson** in direction of all phases of gas dispatching operations in the nine states which the company operates.

Formerly assistant superintendent of gas measurement, Curry has been with Texas Gas since 1949.

Dr. Leo J. Peters has been appointed vice president and general administrator of **Gulf Oil Corporation's Research and Development Company.** He had been a vice president and associate director of the company.

He has been associated with the research company since 1929. Peters was named director, geophysical operations in 1945, and in 1951, was made assistant director of research. In 1953, he became a vice president.

Transwestern Pipeline Company announces the appointment of **Ned C. Turner** to the board of directors. Turner is vice president in charge of engineering and operations.

J. R. Butler, a founder and director of the company will vacate his position of secretary-treasurer, but continue as chairman of the executive committee. **Raybourne Thompson** replaces Butler as secretary and **William A. Koros**, controller and assistant treasurer becomes treasurer.

Harold J. Hewett, Jr., has been appointed by Transwestern as market analyst on sales and distribution. Hewett recently returned from a two-year stay in Argentina with Sargo, S.A. He began his career in the Tennessee Gas Transmission Company Sales Department. He also served with Fish Service Corporation.

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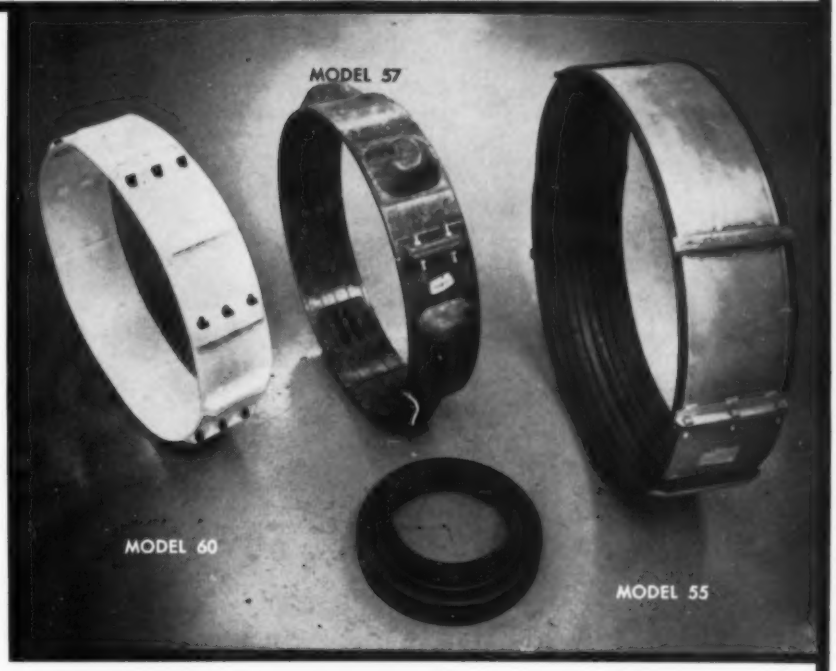

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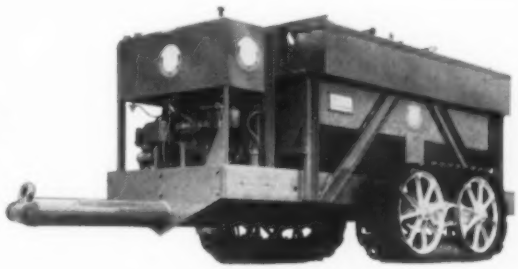

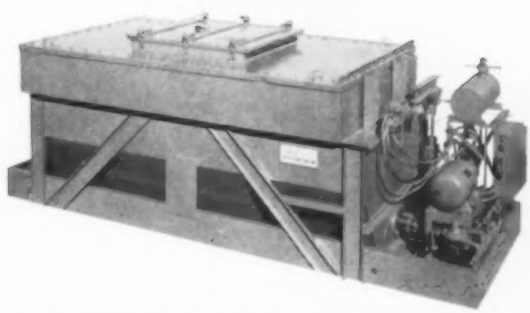

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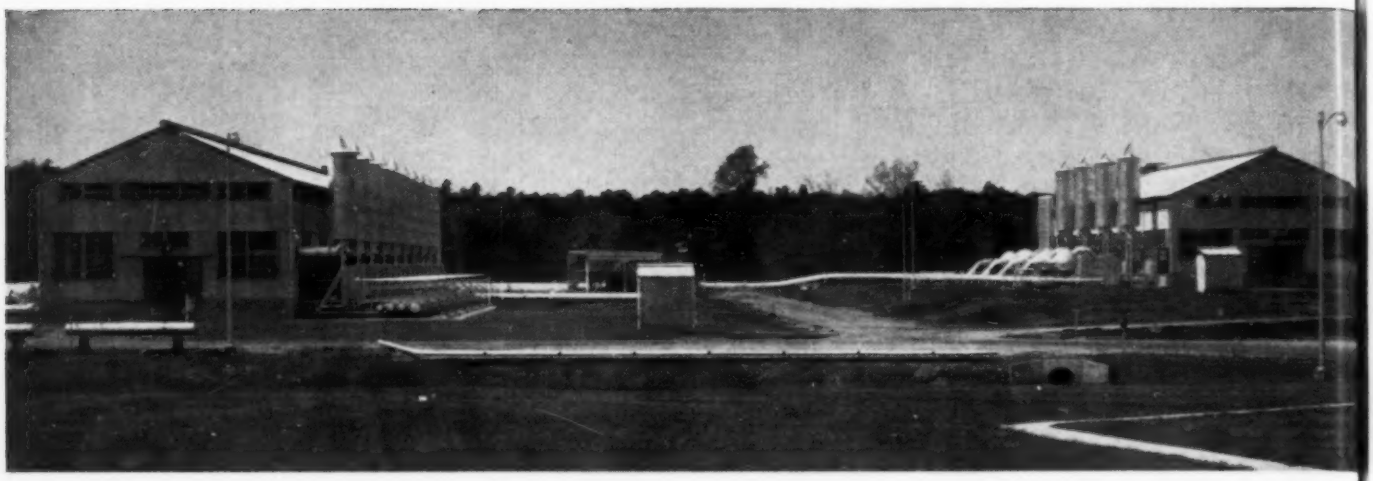
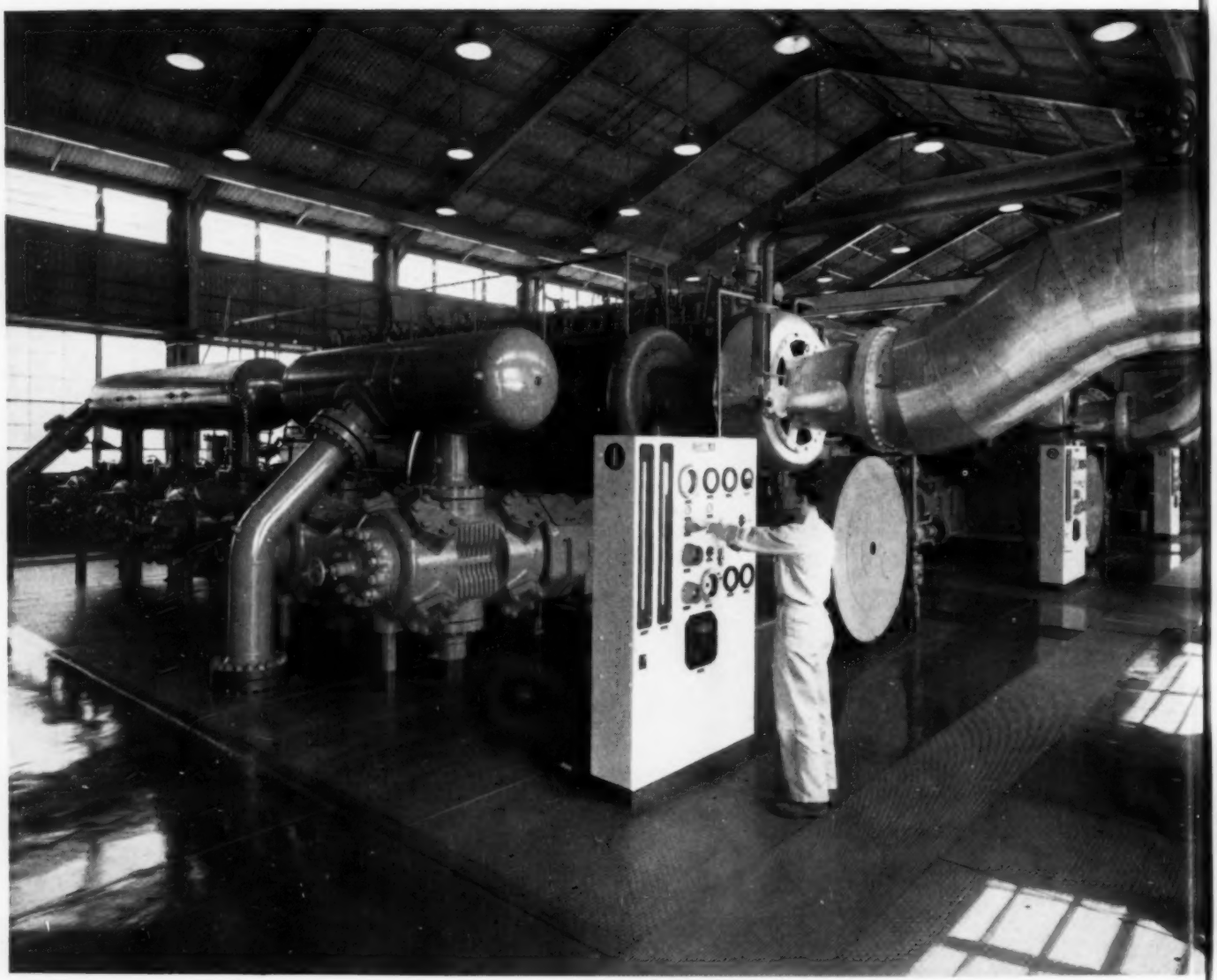
Union Church, Mississippi compressor station of Texas Eastern Transmission Corporation, as it looks today. Nine Clark HBA-8-T turbocharged units totaling 18,450 bhp are housed at left. Four 3400 bhp Clark turbocharged TLA-10 compressors are in adjacent building at the right in photo. Total Clark horsepower now in station – 32,050 bhp.





Four 3400 bhp Clark turbocharged TLA-10 compressors on the Texas Eastern line at Union Church station. Operator is shown at Clark automatic engine starting panel.

"HORSEPOWER TRIPLED, EFFICIENCY VASTLY IMPROVED, MAIN LINE FLEXIBILITY MAINTAINED,"

Reports Texas Eastern on its Union Church Station

In implementing expansion programs for its Texas to New York transmission system, Texas Eastern Transmission Corporation tripled the horsepower of the initial installation at its Union Church, Mississippi compressor station from 10,560 hp to 32,050 hp. In meeting the progressively increasing flow and changing pressure conditions, it was essential to retain line flexibility. By the addition of large reciprocating units in the station it was possible to increase station efficiency by the reduction of installation and operating costs per bhp.

In one of their programs, nine existing Clark HBA-8 compressors were converted to turbocharged operation. This was accomplished with the standard Clark conversion kits, thereby increasing the rating of each unit from 1760 to 2050 bhp while at the same time substantially reducing fuel consumption.

To further increase the horsepower of the station, four Clark turbocharged 3400 bhp Model TLA-10 compressors were installed, thus bringing total installed horsepower at Union Church up to 32,050.

The new TLA-10's gave Texas Eastern the positive dollar saving advantage of large blocks of horsepower which users have found results in lower installed and operating costs per bhp. Another important benefit of installing TLA-10's was the ability of these compressors to operate at compression ratios of 1.275 to 2.0. This is a vitally important factor in obtaining maximum operational flexibilty and expandability for future development.

Pipeline operators have found that the special low ratio pipeline compressor cylinders and Clark low loss nylon poppet valves used on the TLA-10 assure highest compression efficiency at a wide range of ratios. The constant pressure, pure turbocharging system used on the TLA, HBA-T and the new TBA permits operation of these units over a wide range of constant torque speeds at utmost fuel economy over the entire range. The Clark System of turbocharging also assures ample reserve *power* for emergency overloads, and traditional Clark ruggedness means the *stamina* is there to handle it.

There are four models of Clark TLA compressors available in the 1700-3400 bhp range and four models of TBA compressors available in the 1500-3000 bhp range. Your local Clark representative will gladly give you all the facts.

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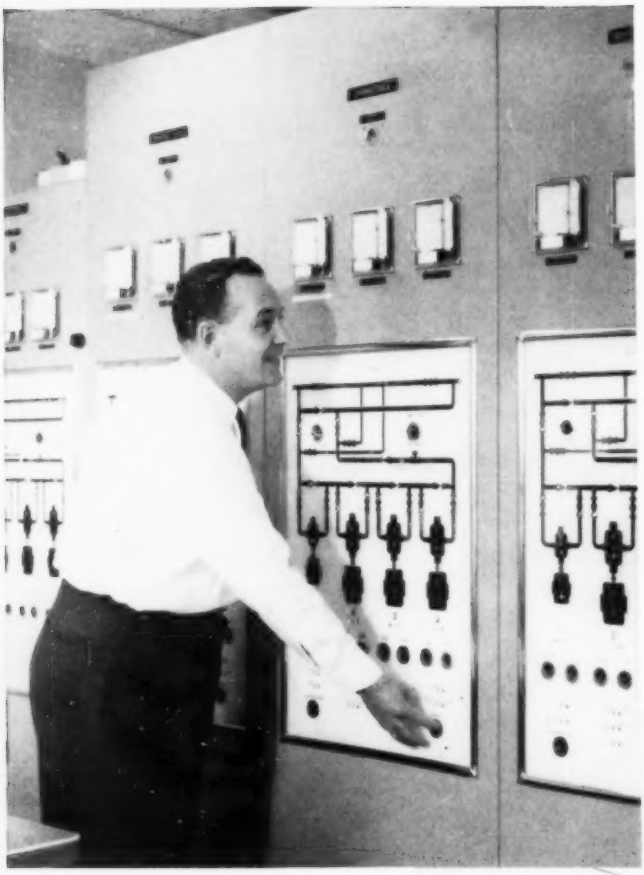
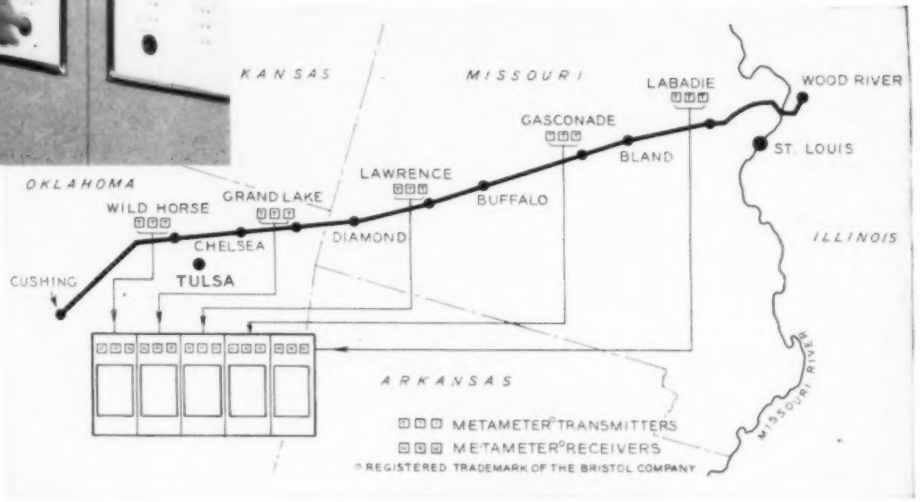
NOTE:
A total of 56 Clark reciprocating units are operating on the Texas Eastern system, together with 33 centrifugal pipeline compressors, including those serving in the compressor stations immediately above and below Union Church, Mississippi.

Bristol telemetering "mans" half the stations on 400-mile crude oil pipeline





Miniature Bristol Metameter® Telemeter Recorders (top row) on central supervisory control panel at Cushing office of Shell Pipe Line Corporation. Instruments, occupying only 5″x5¼″ on panel, indicate and make permanent record of suction, case, and discharge pressure at each of five unmanned stations along 400-mile pipe line. (See map.)

Bristol Metameter* system permits efficient, instantaneous supervision from central office, frees valuable personnel from routine duties.

Midcontinent Division of Shell Pipe Line Corporation, Houston, Texas, uses a Bristol Metameter System for telemetering on the Ozark Pipe Line System, a 400-mile pipe line from Cushing, Oklahoma, to Wood River, Illinois. This system is jointly owned by Shell Pipe Line Corporation and The Texas Pipe Line Company and is operated by Shell Pipe Line.

The Bristol Metameter telemetering system brings pressure readings from five unmanned pumping stations (out of 10 stations in all) along the pipe line into the central dispatching office in Cushing, Oklahoma. (See map.) Using the telemetered readings, the Cushing office can exercise complete supervisory control over pump operation at the unattended stations. Every other station along the line is manned, including the junction point, Cushing, and the terminus at Wood River. This puts personnel within a reasonable distance to take corrective action if trouble develops.

Whether they're used on oil pipe lines, natural gas pipe lines or distribution systems, electric power systems, water plants, or in steel mills or other industrial plants, Bristol telemeters can practically always improve operating efficiency and cut costs. Their accurate, precise readings are transmitted with the speed of radio (VHF, UHF, microwave), or telephone or carrier current lines for distances that may vary from a few yards to hundreds of miles. Pressure, liquid level, flow (including total corrected flow), temperature, mechanical motion, voltage, current, and power are just a few of the variables that can be transmitted.

Bristol developments in industrial telemetering, soundly based on more than 45 years' experience in this field, are making possible today a speed and an effectiveness in central supervisory control that would have been undreamed of only a few years ago. Let us give you full details. Write: The Bristol Company, 114 Bristol Road, Waterbury 20, Conn.

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W. C. Brodhead has been named departmental coordinator of **Gulf Oil Corporation's** Transportation Department. Brodhead, who has been with Gulf for 34 years, will be responsible for the development of transportation plans and programs.

W. C. Brodhead

He joined Gulf in 1926, as a clerk and in 1929, was assigned to the marine division engineering section. In 1955, he became manager of costs and economic performance there. He was transferred to the Pittsburgh general office in 1958, and promoted to marine coordinator, responsible for coordination of all transportation include planning, economics, cost control, scheduling, etc.

J. L. Latimer, chairman of the board of **Magnolia Pipe Line Company,** retired January 1, after 45 years service. He was president of **Magnolia Petroleum Company** from 1946 to 1959, when Magnolia was combined with **Mobil Oil Company,** and served as senior vice president of Mobil. He will continue as a director or trustee of numerous Dallas-based firms, research groups and civic associations.

Latimer joined Magnolia in 1915. He became assistant general manager of the pipe line company in 1937, and the following year was elected a director and vice president of Magnolia Pipe Line and Magnolia Petroleum. In 1946, he was elected president of both companies.

In 1952, he was made board chairman of Magnolia Pipe Line and in 1959, became senior vice president of Mobil Oil. Latimer received the Texas Mid-Continent Oil & Gas Association Distinguished Service Award in 1952.

Hy Yellin

Charles Shelton, Jr.

International Pipeline Associates of Dallas, has been formed by **Hy Yellin** and **Charles Shelton, Jr.** The company will offer economic and feasibility studies, engineering, design, inspection and supervision of construction for pipe lines, gathering systems and terminal facilities.

Yellin formerly was chief engineer of Pipe Line Engineering Company. Shelton was a pipe line advisor to Esso Standard (Libya), Inc. He also had been chief pipe line engineer with Creole Petroleum Corporation.

Robert W. Ross has been appointed manager of the natural gas liquids section of **Cities Service Oil Company's** Supply and Distribution Division.

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Now from one source, Seal-"O"-Ring® gate valves with an extremely compact cylinder operator. With fewer parts than conventional units, the operator's reduced size is achieved through designing the valve stem to act also as a piston rod, bringing the cylinder very close to the valve bonnet (1). In some sizes, the valve bonnet actually becomes the lower cylinder head of the operator. The operator comes equipped with a specially designed four-way valve (2) which controls the cylinder. Utilizing line pressure, fluid is applied to either end (3) moving the piston and gate to the open or closed position. A variable orifice (4) in the discharge controls operating speed. Designed for general pipeline service, where ease of operation and/or remote control is necessary.

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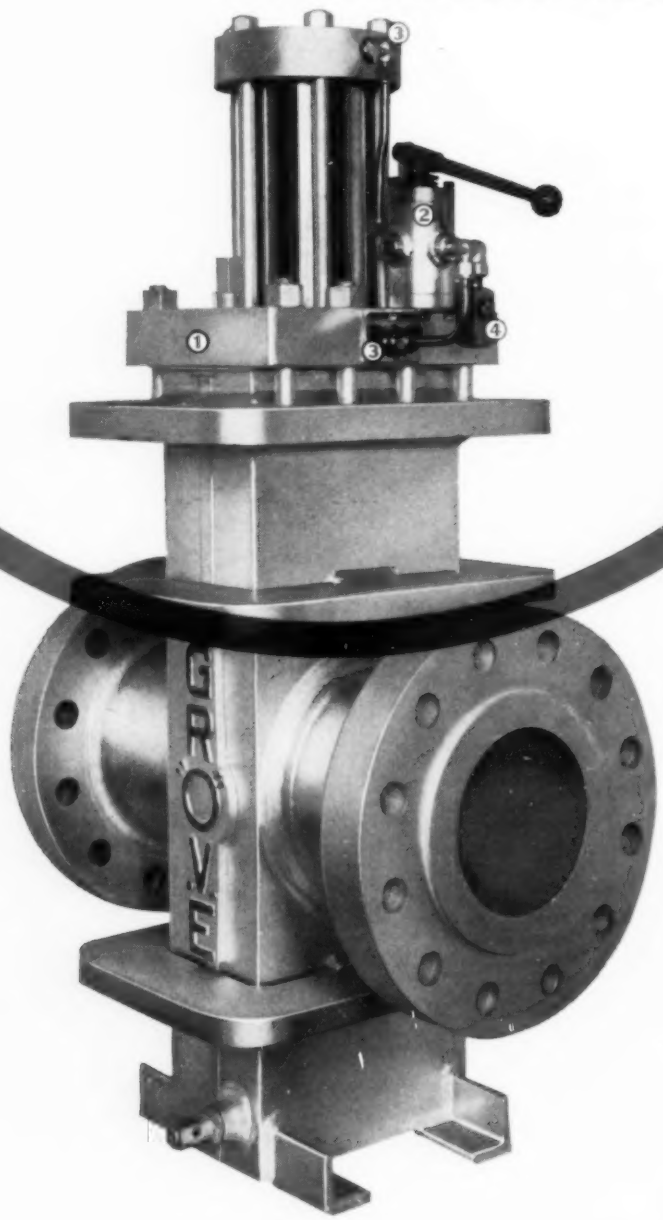

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Governor Price Daniel of Texas became the fourth Texas governor to head the interstate oil compact commission when he was named chairman of that group in a meeting at Phoenix, Ariz. Daniel, who will serve one year, succeeds Kansas **Governor George Docking.**

The oil and gas conservation group also elected **Dr. Walter Jones** Tuscaloosa, Ala., first vice president, and **Fred Moran** Owensboro, Ky., second vice president. **Lawrence R. Alley** and **Earl Foster,** Oklahoma City, were renamed executive secretary and general counsel.

Tennessee Gas Transmission Company has established two new subsidiaries in its realignment of the corporate structure of the company to segregate its regulated gas pipe line business and its oil operations and other non-regulated activities. Several appointments were also announced by the company.

The newly formed **Tenneco Corporation** will own the non-pipe line properties of the organization. The **Tenneco Oil Company,** a subsidiary of Tenneco Corp., will operate the TGT's producing, refining and marketing properties.

Harold Burrow becomes president of **Tennessee Gas Transmission** and **R. L. McVey** will be executive vice president. **W. C. McGee, Jr.,** president of **Tennessee Gas Pipeline Company,** was named a director to succeed **Ardon B. Judd** who retired to director-emeritus.

Tenneco Corporation will direct all non-regulated interests in petro-chemical, life insurance and real estate fields of TGT. Tenneco Oil Company will operate facilities of three TGT divisions—Tennessee Gas and Oil Company, Tennessee Oil Refining Company and the Tennessee Overseas Company.

Cecil C. Johnson has been elected president and **Harley F. Eaker** becomes vice president of the new corporation. Officers include **Gardiner Symonds,** chairman and chief executive officer of TGT; **Burrow; McVey; R. C. Graham** and **Johnson.** Graham becomes president of Tenneco Oil Company. **R. R. Dean,** formerly president of Tennessee Oil Refining becomes vice chairman of Tenneco Oil. Senior vice presidents include **W. E. Scott; S. C. Oliphant** and **W. C. Hildebrand.**

William H. Huffman, right-of-way and claims coordinator for **Humble Pipe Line Company,** was named president of Gulf States Chapter of the American Right-of-Way Association. He succeeds **Glenn P. Thompson,** manager of **Tennessee Gas Pipeline Company's** Houston Right-of-Way Department. He was elected to a two-year term as national director.

Volney H. Kyle, Jr., has been named president of **North Carolina Natural Gas Corporation** succeeding **P. McDonald Biddison,** who retired. The gas company also named two new directors. **William C. Gilman** and **Albert H. Daggett** were appointed to the board.

Deaths

Lyle Roberts Sheppard, 56, Shell Pipe Line Corporation, died in a Houston hospital December 12. Sheppard had been a member of the National Association of Corrosion Engineers for 12 years.

WHO'S MEETING WHERE

January

Pipe Line Contractors Association, annual meeting, Fairmont and Mark Hopkins Hotels, San Francisco, January 15-18.

ISA, winter instrument-automation conference and exhibit, Sheraton-Jefferson Hotel and Kiel Auditorium, St. Louis, January 16-19.

NGAA, Gulf Coast Regional meeting, Robert Driscoll Hotel, Corpus Christi, Texas, January 20.

Instrumentation for the Process Industries, A & M College, College Station, Texas, January 25-27.

February

NACE, short course, Houston Section, Rice Hotel, Houston, February 2-3.

Southwestern Legal Foundation Institute on the Law of Oil, Gas and Taxation, Southwestern Legal Center, Dallas, February 8-10.

NACE, short course, Shreveport Section, Centenary College, Shreveport, La., February 14-15.

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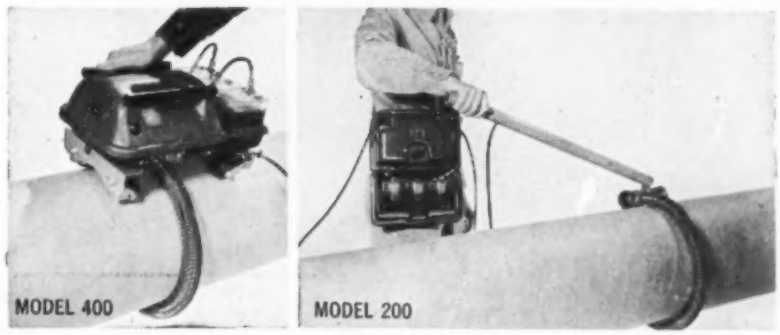

Rugged equipment for dependable holiday detection on ¾" to 36" pipe . . . signal—bell, light and spark . . . unaffected by dew or frost.

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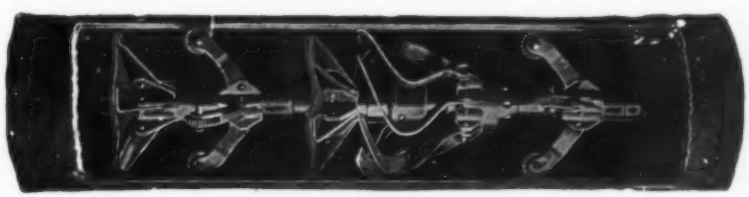

THE GO-DEVIL — READY TO GO!

Partly compressed guide arms and knives are held tight but flexible against pipe walls by pressure of individual springs. Guide arms keep scraper in line, eliminating undue driver wear and prevents cocking. Flexibility permits Go-Devil to round bends.

Go-Devil

G. A. COTTEN CO. **P. O. Box 5332** **Tulsa, Oklahoma**

Pipe Line Contractors Association of Canada, seventh annual convention, Empress Hotel, Victoria, B. C., February 23-25.

NGAA, South Louisiana Regional meeting, Lafayette Petroleum Club, Lafayette, La., February 24.

American Institute of Mechanical Engineers, annual meeting, Chase & Park Plaza Hotels, St. Louis, February 26-March 2.

March

ASME, Gas Turbine Power Division, co-sponsored by the Department of Defense, sixth annual conference and exhibit, Shoreham Hotel, Washington, D. C., March 5-9.

NACE, seventeenth annual conference, Hotel Statler, Buffalo, N. Y., March 13-17.

New England Gas Association, annual meeting, Hotel Statler, Boston, March 15-17.

NGAA, 40th Annual Convention, Baker Hotel, Dallas, March 15-17.

AGA General Management Section conference, Frances-Marion Hotel, Charleston, S.C., March 20-22.

American Society for Metals, 12th western metal congress and exposition, Pan American Auditorium, Los Angeles, March 20-24.

American Power Conference, Sherman Hotel, Chicago, March 21-23.

Mid-West Gas Association, annual meeting, Sheraton-Fontenelle Hotel, Omaha, Neb., March 27-29.

University of Oklahoma, Schools of Petroleum and Gas Engineering, gas conditioning short course, Oklahoma Memorial Union Building, University of Oklahoma, Norman, Okla., March 28-29.

April

University of Oklahoma, School of Mechanical Engineering, short course of industrial engines, University of Oklahoma, Norman, Okla., April 6-7.

ASME, oil and gas power conference and exhibit, Jung Hotel, New Orleans, April 9-13.

ASME, maintenance and plant engineering conference, Bancroft Hotel, Worcester, Mass., April 10-11.

PIEA-PESA, annual meeting, Galveston, Texas, April 11-13.

University of Oklahoma, Southwest Gas Measurement Short Course, North Campus, Norman, Okla., April 18-20.

American Welding Society, meeting and show, Commodore Hotel, New York, April 18-20.

AIME Society of Petroleum Engineers, East-Texas, Louisiana, Arkansas gas technology symposium, Tyler, Texas, April 20-21.

Southern Gas Association, annual convention, New Orleans, April 24-26.

API, Division of Transportation, annual meeting, Chase Park Plaza Hotel, St. Louis, Mo., April 26-28.

NGAA, Oklahoma regional meeting, Lake Murray Lodge, Ardmore, Okla., April 28.

May

Pacific Coast Gas Association, transmission conference, Biltmore Hotel, Santa Barbara, Calif., May 4-5.

NGAA, Permian Basin regional meeting, Lincoln Hotel, Odessa, Texas, May 19.

MID-AMERICA

BUILDS FOR ENDURANCE

Mid-America Pipeline Company's new line will carry LPG all the way from the West Texas and New Mexico area to Minnesota and Wisconsin—2,200 miles of pipe. A big job of construction. Big investment in money too! Pipelines must be built to last.

That's why Reilly Intermediate Enamel with Q. D. Primer, were specified as coatings for a portion of the Mid-America system to lend lifelong protection against corrosion to the new line. Coal Tar Enamels are the engineering materials of choice where endurance of protection against corrosion is a design requirement.

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BOOKS

Continuous Production of Natural Gas Supplements from Natural Gasoline and Petroleum Distillates in a Tube Furnace, W. G. Blair and H. R. Linden, Institute of Gas Technology, Chicago, $5.

This bulletin reports the pilot plant development of a continuous process for the gasification of natural gasoline, naphtha, kerosine and No. 1 fuel oil.

The objective of the study was to develop a low investment cost process capable of delivering a high heating value fuel gas directly substitutable for natural gas. Three methods of operation were investigated, all comprising exposure of the vaporized feedstocks to temperatures of 1300° F to 1500° F, and moderate pressures not exceeding 100 psig:

1. Thermal cracking in the absence of a carrier gas,
2. Thermal cracking in the presence of hydrogen carrier gas supplied from an external source (pressure hydrogasification) and
3. Thermal cracking with hydrogen carrier gas generated as part of the process (internal pressure hydrogasification).

Detailed information on raw material requirements, product yields and compositions, and equipment design, is given for each method of operation.

1st

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HOT & COLD APPLIED COATINGS

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IT'S NEW! **EASIER TO USE!**

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MOUNTS AND CUTS ON SHORT LENGTHS OF PIPE!

For a welcome distinctive change in pipeline equipment, Mathey is proud to announce their newly designed Pipe Beveling Machine. It's extremely lightweight and requires only ½ the storage space. No. 1-SA machine can be operated on pipe segments as short as 9" and still cut 1" off pipe. In larger models weight is proportionately lighter.

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...NO OTHER PIPE FITTING DOES SO MANY JOBS SO WELL

Designed for fast, easy installation plus economy

Plidcoflange applications are practically limitless. This versatile pipe fitting may be welded permanently to the pipeline, without shutting down, or bolted in place for future removal.

Plidcoflange slips over end of pipe, mates up with standard flange facings. No flange spreaders, jacks or bars required. Ideal for use as a blind plate flange. Just slide Plidcoflange back to change plates.

Plidcoflanges are available in standard sizes 2" through 12" with 150 lb. A.S.A. steel flanges. Other sizes and pressure classes on request. Send for illustrated brochure.

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REPRESENTATIVES THROUGHOUT THE WORLD
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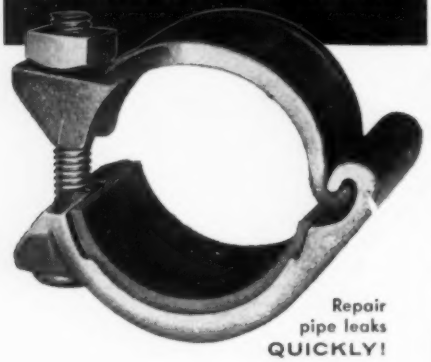
For Speediest Repair of Corrosion Leaks in Pipe

JUNIOR

EMERGENCY PIPE CLAMP

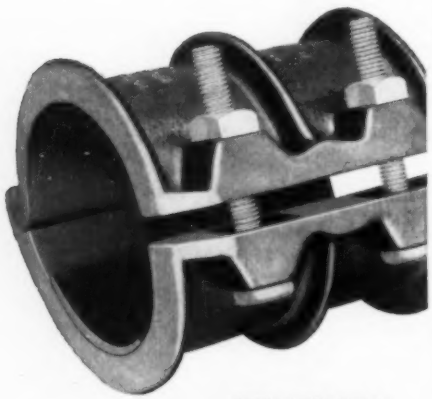


Repair pipe leaks QUICKLY!

Speediest application — slotted lug permits the single plated bolt to slide instantly into place.

A companion to the old reliable Emergency Pipe Clamp that has served industry for a half century, the JUNIOR, a single bolt clamp, is 2⅞" wide. Undersells most band-type clamps.

Made of malleable iron, ruggedly proportioned, with full-length hinge along one side. Formed to exact pipe size—no bending. The recessed pressure-equalizing gasket, entire width of clamp, is cemented in. A lasting installation. 2" pipe size—$1.80; 2½"—$2.20; 3"—$2.30. Write for new circular on the Junior.



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EMERGENCY PIPE CLAMPS for safe, sure lasting repair of splits and rust holes in pipe. No pressure too high. Anyone can apply in a few moments. Made in all sizes, ½" to 12", for steel and C. I. pipe. Stocked by practically all oil supply stores.

Send for catalog!

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What's Happening among SERVICE and SUPPLY MEN

General Electric Names Minichiello Mobile Manager

Raymond Minichiello has been named manager of mobile communications product planning for General Electric's Communication Products Department. He will have responsibility for product development guidance on vehicular two-way radios, portable transceivers, pocket units and associated systems devices. He replaces Dale L. Bunday, who joined Communications Engineering Company, as a sales engineer. The latter company is a General Electric manufacturer's representative. Minichiello has specialized in electronics and communications for the company for 19 years. In 1956 he was appointed communications engineer for Communication Products Department office at Wellesley, Mass., and named district sales manager there in 1958.

Minichiello

McNeill Named Sales Engineer For Grove Valve and Regulator

Grove Valve and Regulator Company has named J. D. McNeill sales engineer for pipe line and production valves and pressure regulators in Canada. McNeill has been associated with National Supply Company, Limited, in sales capacity and previously was with the Amerada Petroleum Corporation. He will be headquartered in Calgary, Alta.

Armco To Modernize Spiral Welded Pipe Plant Facilities

Armco Steel Corporation will spend $2.5 million to consolidate its spiral welded pipe manufacturing operations in a modern fully integrated plant in Middletown, Ohio.

Four new buildings with 207,000 square feet of floor space will be erected to accommodate the present pipe manufacturing facilities. Two Driam pipe machines also will be installed in the layout.

Robertshaw-Fulton Controls Company Names Wehrli Assistant to President

Robert L. Wehrli, vice president and general manager, has been named vice president and assistant to the president for Robertshaw-Fulton Controls Company. Raymond H. Heller will succeed Wehrli as general manager of the Aeronautical and Instrument Division, in Anaheim, Calif. Replacing Heller as director of field engineering and sales will be Charles H. Unruh, advertising manager of the division.

Wehrli, who will be headquartered in Richmond, Va., has been with the company since 1954, and was named vice president and general manager of the Aeronautical and Instrument Division.

United States Steel Corp. Promotes Norman B. Obbard

Norman B. Obbard has been named executive vice president, international, for United States Steel Corporation. Obbard began his career with Truscon Steel Company in 1924 as a draftsman. At United States Steel he was named assistant executive vice president, operations in 1956, and became administrative vice president, production in 1958.

Case Company Names Hedrick Oklahoma City Branch Manager

George C. Hedrick has been named manager of the Oklahoma City branch of J. I. Case Company. Hedrick, formerly manager of the branch at Amarillo, Texas, replaces O. C. Teigen, who has been transferred to the company headquarters in Racine, Wisc. Hedrick has been with the company for 23 years.

SIE Division Names Bennett Assistant to the President

Roy F. Bennett has been named assistant to the president for Dresser Electronics, SIE Division. Bennett has been a petroleum exploration consultant in Oklahoma City and previously had been chief geophysicist and foreign exploration manager for Sohio Petroleum Co. for 15 years.

Rhoades Appointed Cooper-Bessemer Design Engineer for Special Projects

Warren Rhoades has been appointed design engineer, special project for Cooper-Bessemer Corporation. He had been field sales representative for the corporation's southwest marketing district with headquarters in Dallas.

Write for Bulletin

PIPELINE VENTS AND MARKERS

FLEET-LINE CO.

P. O. BOX 276-K
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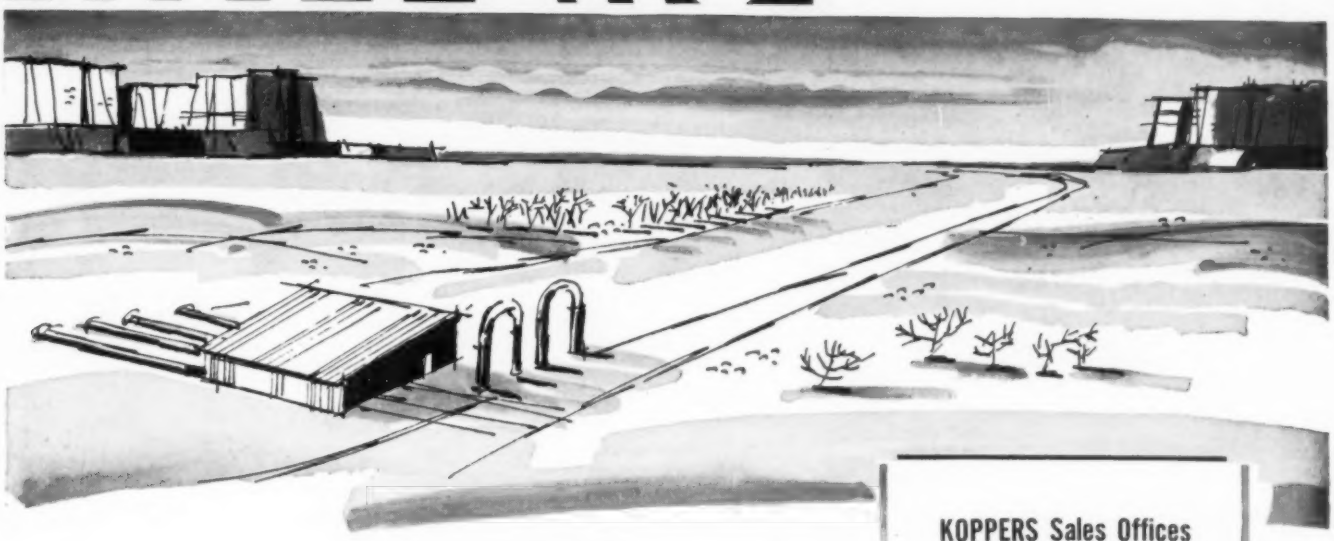
KOPPERS

on-the-spot availability of rings keeps your lines "on stream"



Dependable performance in all oil and gas applications

Koppers Piston Rings are now available in the field in a complete range of materials and a wide selection of types and sizes for every application in the oil and gas industry.

To gain trouble-free performance, lower operating costs and less frequent down-time, select Koppers Piston Rings—the choice of many original equipment manufacturers.

Koppers Piston Ring dependability, in even the most rugged applications, is backed with 38 years of experience in manufacturing rings of predictable performance.

If you have a ring problem, consult your Koppers field agent or write: KOPPERS COMPANY, INC., Piston and Sealing Ring Department, 7101 Scott Street, Baltimore 3, Maryland.

Send now for Koppers recommended Piston Ring Set-Ups applicable to the engines which you operate.

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Engineered Products Sold with *Service*

New time multiplexing and remote
and reduce line requirements for

Five new basic time multiplexing systems—and a new remote index setting feature—add to the overall versatility of *Dur-O-Pulse* . . . give you advantages available in no other telemetering system.

With Time Multiplexing Units—

- You can transmit up to 15 signals either in one or two directions over a single channel.
- You can add intermediate stations without adding any additional transmission lines.

With Remote Set Index—

- Easy to set—set the index, push a button and the rest is automatic: a pulse whose duration is directly proportional to the value of the set point is transmitted to remotely located controllers.
- Can be used as part of a multiplexing system.

The *Dur-O-Pulse* system measures and transmits process variables such as pressure, temperature, flow, level, voltage, current, power and speed. It can send data quickly and accurately over all types of circuits.

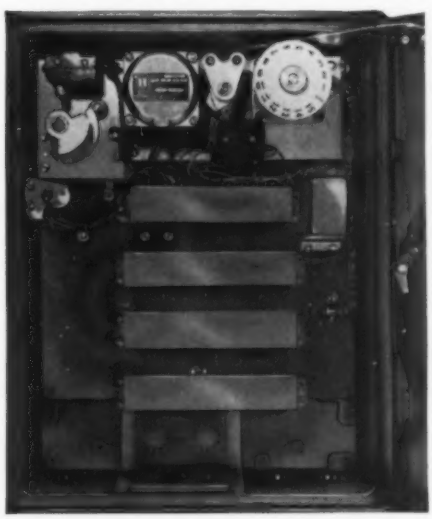
set index setting simplify operation Dur-O-Pulse telemetering systems

- Gives you set point indication at transmitting and receiving instruments.
- A single tone is required for the index signal when audio tone multiplexing is used.

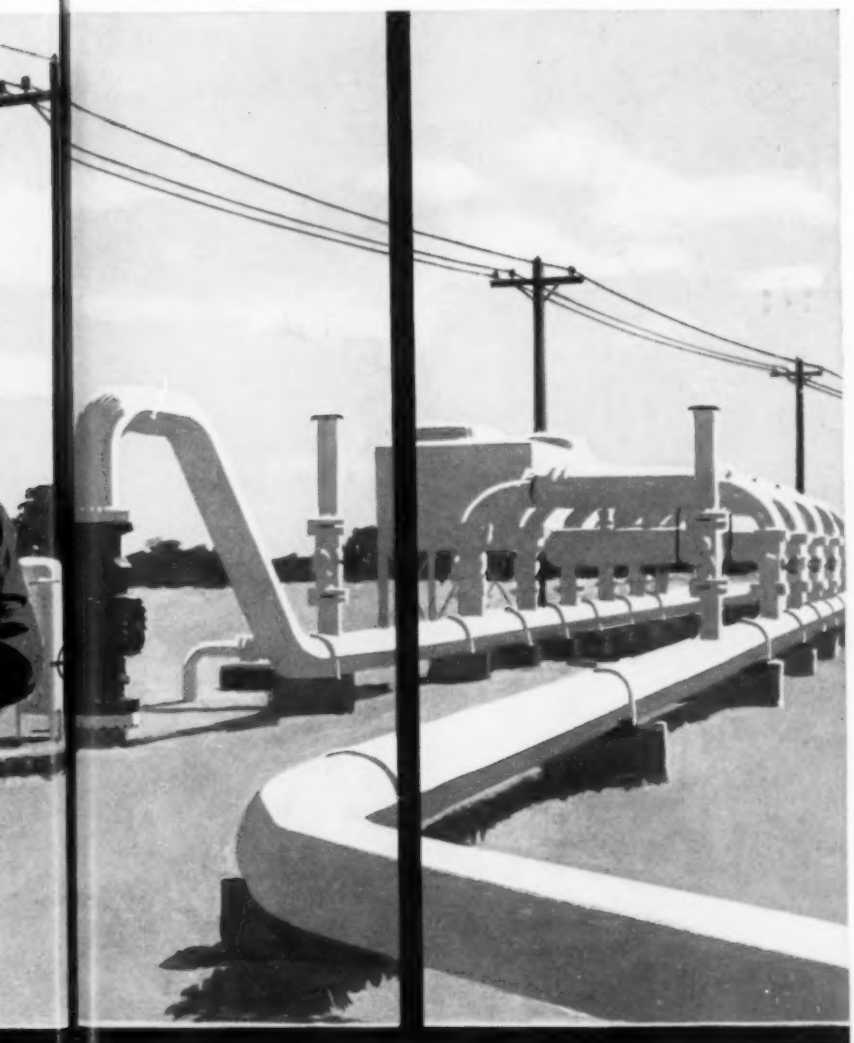
Find out about *all* the performance and maintenance advantages of *Dur-O-Pulse* from your nearby Honeywell field engineer. Call him today . . . he's as near as your phone.

MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa. In Canada, Honeywell Controls, Ltd., Toronto 17, Ontario.

REMOTE-SET INDEX TRANSMITTER eliminates separate push buttons or switches needed to drive controller index up or down scale. To readjust controller index it is necessary only to adjust the indicating pointer to the desired set point and push the start button.



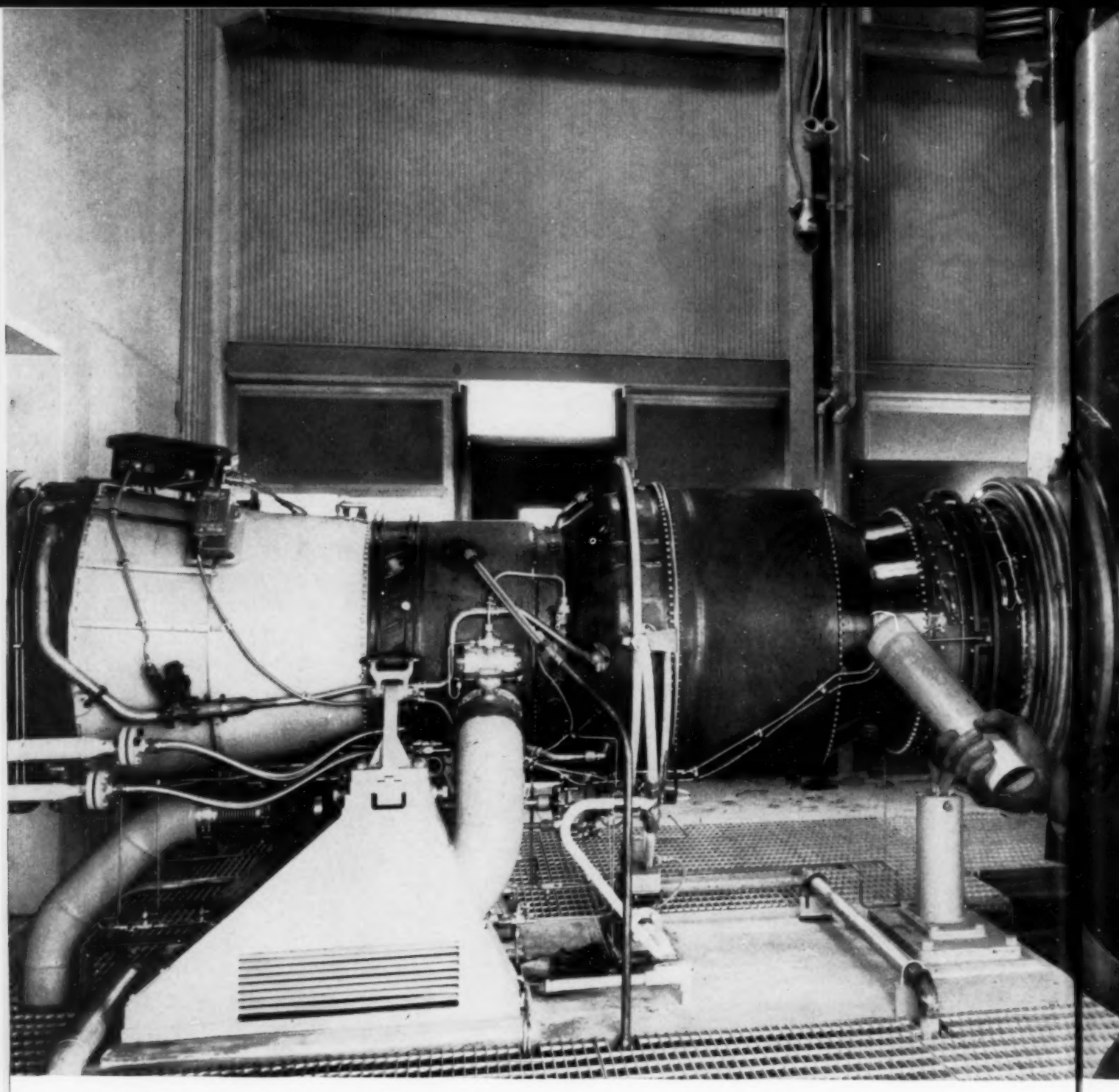
TIME MULTIPLEXING UNITS transmit up to 15 variables in one or both directions and provide a synchronizing signal to keep transmitting and receiving units in step.



Honeywell

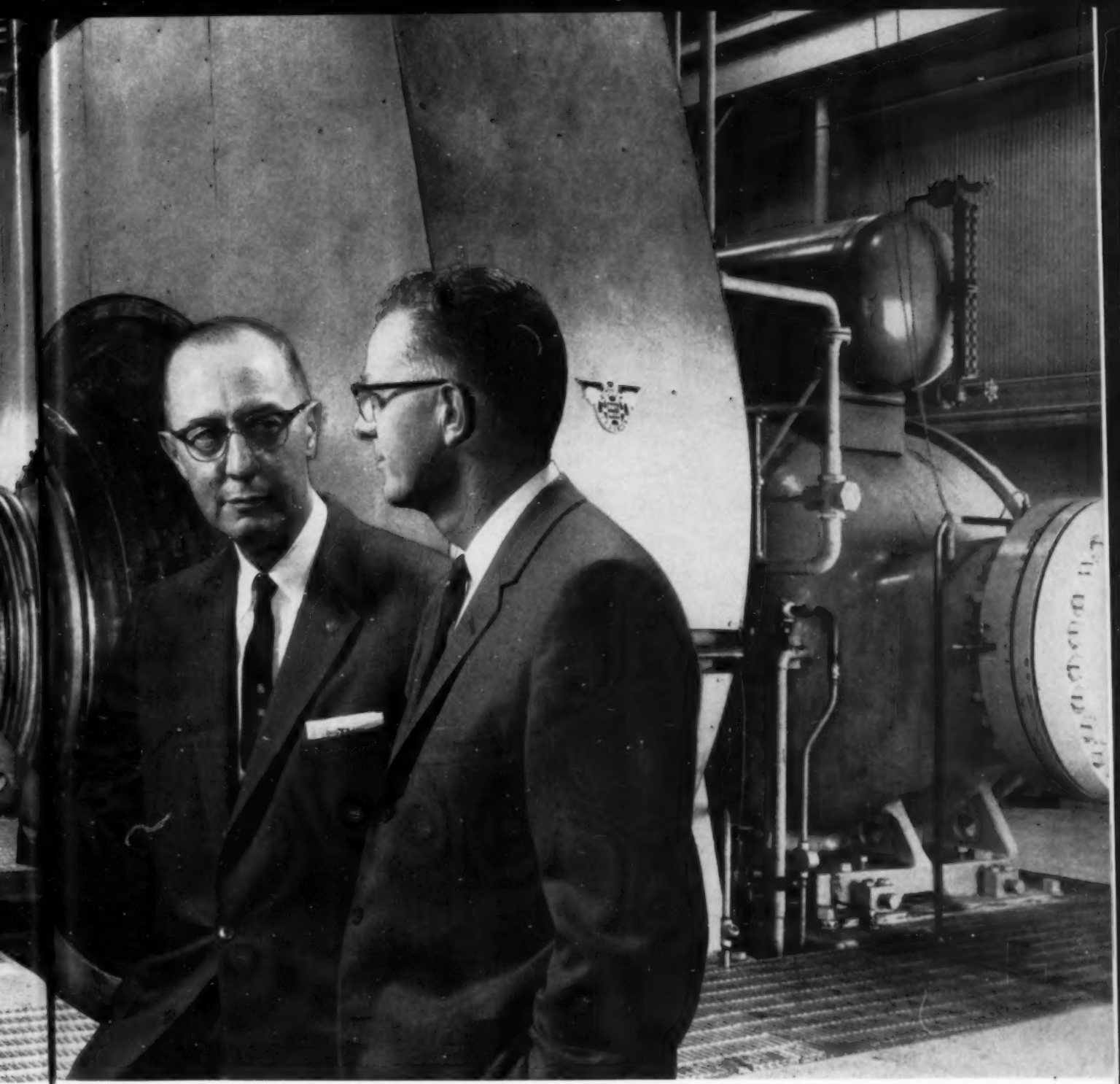
First in Control

SINCE 1885



R. L. Boyer, *Vice President and Director of Engineering, and* W. B. Boyum, *Manager of Gas Turbine Sales, The Cooper-Bessemer Corporation report . . .*

World's first jet powered gas turbine is now on the job



YOU are looking at a revolutionary new concept in industrial power. This Cooper-Bessemer 10,500 hp RT-248 gas turbine with a modified Pratt & Whitney Aircraft J-57 jet engine introduces new, drastic economies in plant construction, operation and maintenance. Shown here on the job at the Clementsville (Kentucky) Compressor Station of Columbia Gulf Transmission Company, this powerful, compact unit has taken on the total gas-boosting load of the station, operating 'round the clock. Find out how this outstanding joint development of Cooper-Bessemer and Pratt & Whitney Aircraft can fit into *your* plans for compressors, generators and other rotating machinery. Call our nearest office.

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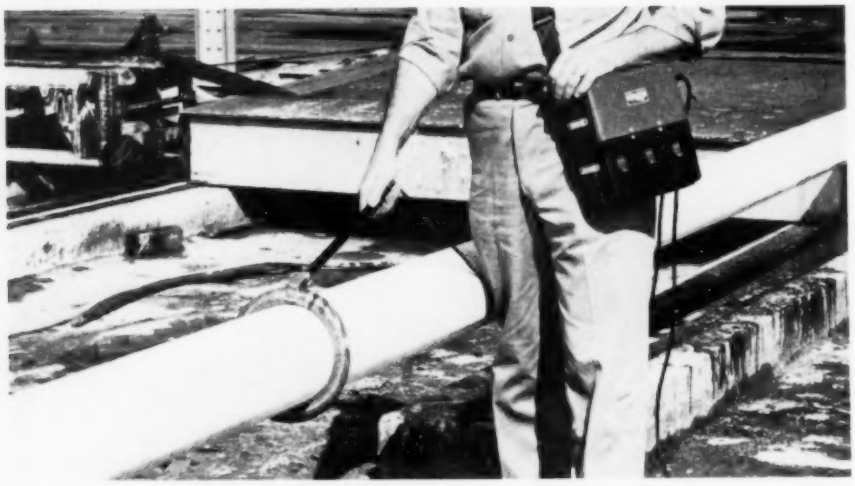
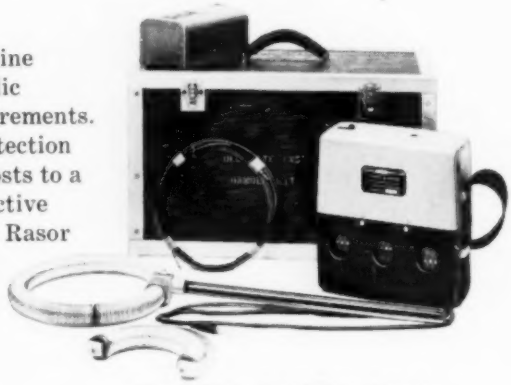
INSPECTION IS THE KEY TO GOOD PIPE COATING



TINKER & RASOR HOLIDAY DETECTORS

insure coating continuity

Every void in your pipeline coating increases cathodic protection current requirements. To obtain maximum protection and hold maintenance costs to a minimum, inspect protective coating with a Tinker & Rasor Holiday Detector and make repairs before backfilling.



Tinker & Rasor E P Holiday Detector.
Portable, "damp-climate" pulse type.

Write for your free Data Kit.

Tinker & Rasor has prepared a complete data kit of descriptive material and recommended procedures for inspecting protective coatings. Material includes technical data on equipment, recommended inspection procedures, general discussion of types of detectors, theory of operation, etc.

ENGINEERING NOTE:
To insure a perfect application, include Tinker & Rasor Holiday Inspection. Write for specification guide.

Quality Control for Coating Application

TINKER & RASOR

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Bucyrus-Erie Co. Board Elects Two New Directors

Eugene P. Berg and Ernest S. Everitt were elected to the board of directors of Bucyrus-Erie Co. Berg joined the company in November 1960 as executive vice president. Previously, he was general manager of all Chicago operations of Link Belt Company and had been with that firm since 1937. Everett, a 33-year veteran with the company, is managing director of Ruston-Bucyrus Ltd., an affiliated company in Lincoln, England. He was named to that position in 1944.

Aluminum Company Appoints Wanderer Development Manager

Edward T. Wanderer has been named development manager, machinery and equipment, a new position in the Aluminum Company of America Development Division.

Wanderer, formerly director of the petroleum section, now directs the activities of three division sections charged with furthering the use of aluminum in petroleum, chemical and electrical industries and in heating equipment and machinery. Ralph L. Horst becomes manager of the petroleum section. He has been with the company since 1948.

Youngstown Sheet and Tube Company Names Assistant Purchasing Agents

Benjamin H. Pritchard and William B. Seeman have been appointed assistant purchasing agents by Youngstown Sheet and Tube Company. Pritchard has been with the Purchasing Department since 1939. He became a buyer in 1952, and buyer group leader in 1956. In his new position he will handle salvage and supervise clerical personnel. Seeman joined the company in 1938, and in 1952, became a buyer. In 1956, he was promoted to group leader. He will supervise purchases of materials for repair, maintenance and operating.

Clifford L. Benedict Joins White Diesel Engine Division

Clifford L. Benedict has joined the compressor sales engineering force of the White Diesel Engine Division of The White Motor Company. He has spent several years in the sales engineering phase of the compressor building.

Pipe Line Service Corp. Building New Coating Plant

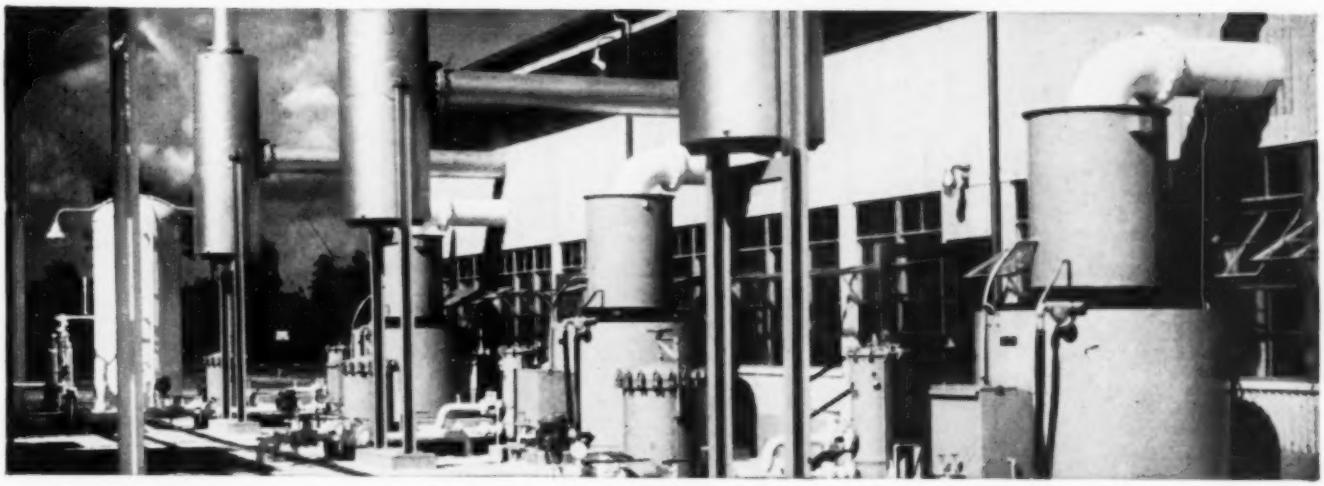
Pipe Line Service Corporation has started construction on a new steel pipe coating and wrapping plant in Youngstown, Ohio. The 94,000 square foot plant will be the eighth pipe coating plant operated by the company and is scheduled for completion in 1961.

Pipe Line Service has been licensed by Republic Steel Corporation to use X-Tru-Coat, a plastic coating for steel pipe lines. Plastic coating operations will begin in early January at the Sparrows Point, Md., plant and in April at Youngstown.

Western Supply Company Names Clark Sales Representative

Robert C. Clark has been appointed sales representative for Western Supply Company. He will work out of the Tulsa office and his territory will include all of Oklahoma. Previously, Clark was a field engineer for Baroid and a sales representative for United Mud Service in Tulsa.

AAF cleans gas...



...as well as air on new Texas-Florida pipeline

● On Houston Corporation's new Texas-to-Florida pipeline, both intake air for compressor engines AND gas being pumped are cleaned by AAF!

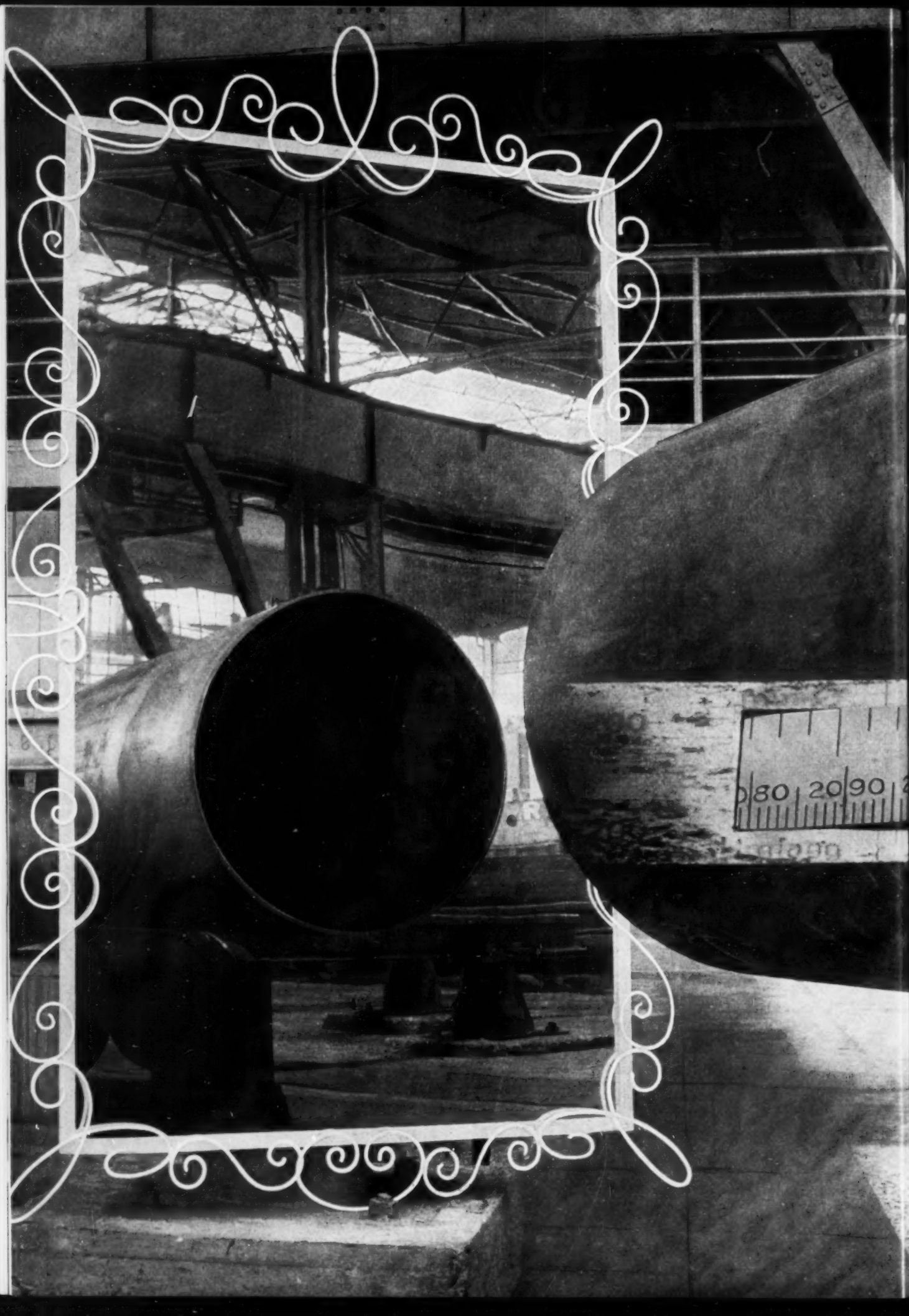
The pipeline – operated by Houston Texas Gas and Oil Corporation – is bringing natural gas to Florida for the first time. And it's *clean* gas, too, after it passes through AAF horizontal gas cleaners (top photo). These oil-bath cleaners (installed at all compressor stations on the line) remove liquids, contaminants, and foreign matter from the gas before it goes into the compressors for transmission.

Smoother engine performance is assured by AAF Cycoil Kool-Airs (bottom photo). These combination cleaner-coolers – which also operate on the oil-bath principle – condition intake air before it goes into the engine.

American Air Filter can help with *your* air- or gas-cleaning problem – wherever it might be in the petroleum or petro-chemical industry. You can get complete information from your nearest AAF representative, or by writing Mr. Robert Moore, American Air Filter Company, Inc., 450 Central Avenue, Louisville, Kentucky.

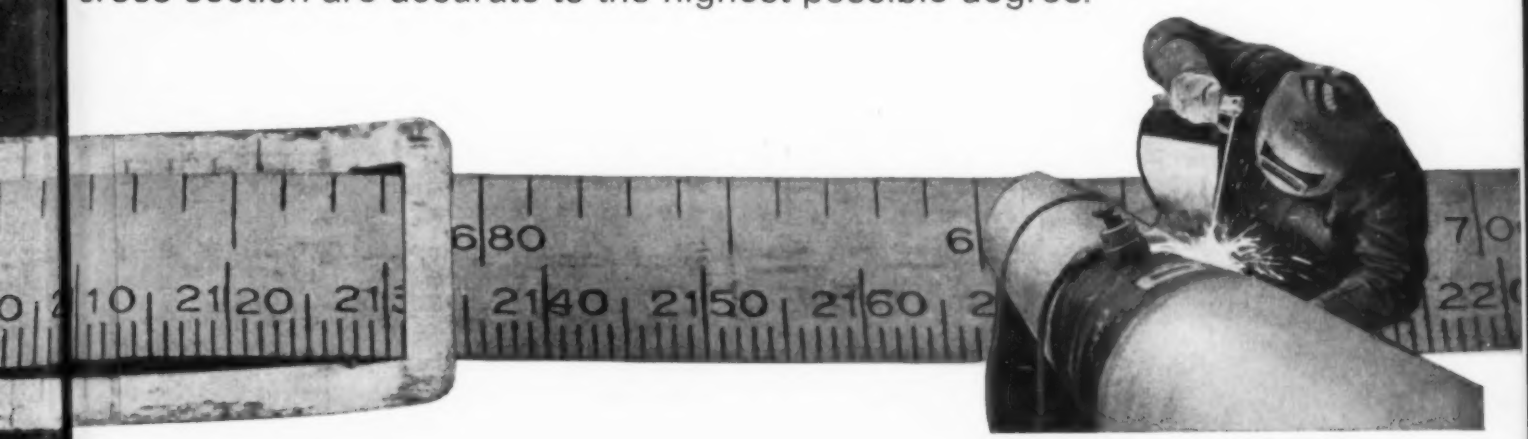
AAF American Air Filter

BETTER AIR IS OUR BUSINESS



All's well that ends well

Both ends of any length of Mannesmann-Hoesch line-pipe are so meticulously sized that they seem to be mirror images of each other – even perfectionists among you pipeliners will be pleased. From the selection of the steel all the way through to the final rugged tests Mannesmann-Hoesch is guided by the fact that a pipeline can be laid only as fast as it can be welded.
With our advanced production technology and sensitive measuring methods, it is virtually impossible for any length of Mannesmann-Hoesch pipe to leave the works unless inside and outside diameter, wall thickness, bevel, and true circular cross section are accurate to the highest possible degree.



Truly round pipe
means faster welding in the field

Grossrohrwerk Mannesmann-Hoesch GmbH

produces line-pipe from 6⅝" through 42" according to API 5 LX and other applicable standard specifications.

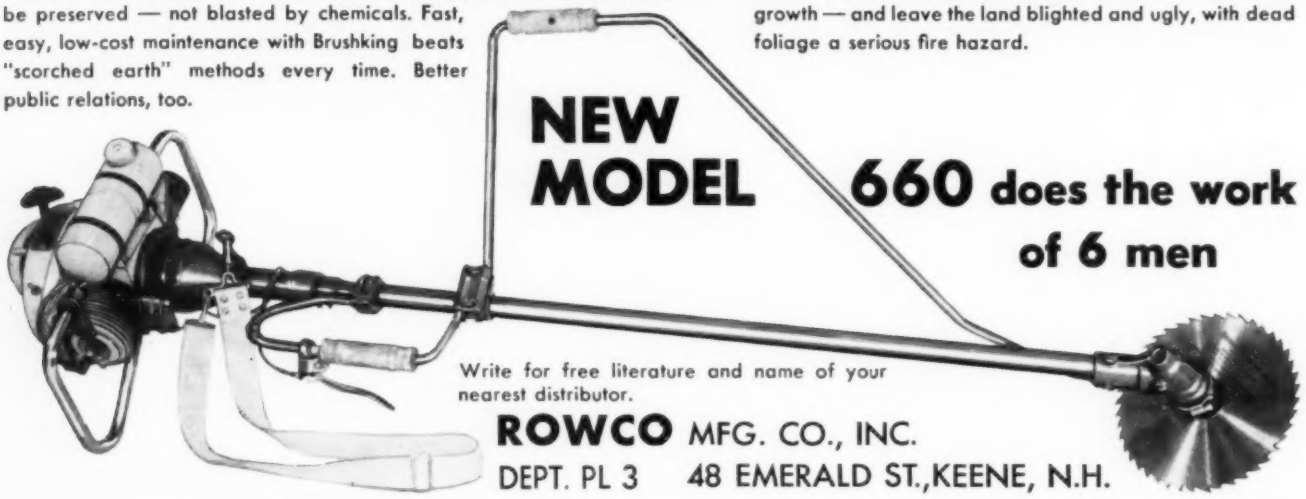
For detailed information, please write:

MANNESMANN-EXPORT · DÜSSELDORF · GERMANY 1376/1e

ROWCO BRUSHKING PORTABLE POWER BRUSHCUTTER GIVES YOU

This pipeline right-of-way is being cleared of brush and saplings with a Rowco Brushking Model 660. All the fresh green beauty of the landscape will be preserved — not blasted by chemicals. Fast, easy, low-cost maintenance with Brushking beats "scorched earth" methods every time. Better public relations, too.

This is what chemical brush and weed killers do to pipeline rights-of-way. They kill, without removing, the undesirable growth — and leave the land blighted and ugly, with dead foliage a serious fire hazard.



NEW MODEL 660 does the work of 6 men

Write for free literature and name of your nearest distributor.

ROWCO MFG. CO., INC.
DEPT. PL 3 48 EMERALD ST., KEENE, N.H.

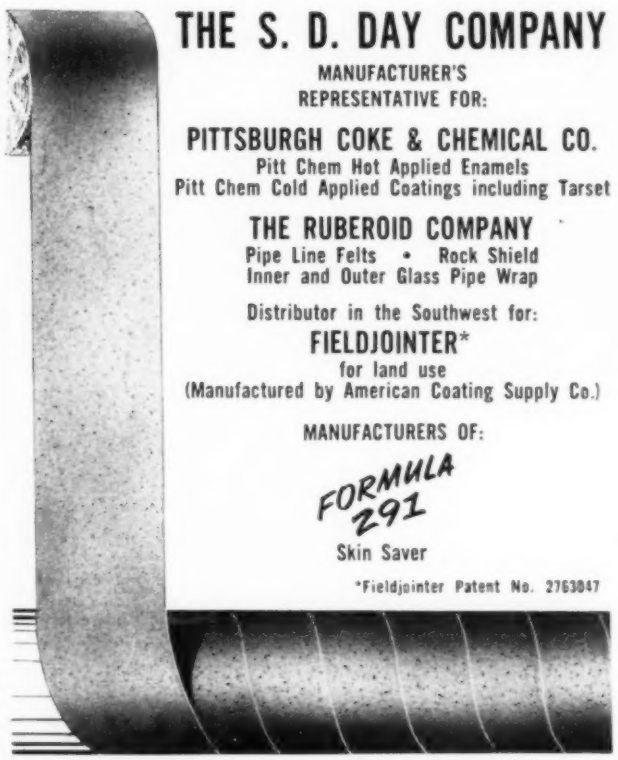
NEW high frequency, resistance welded pipe

If you want a closer source for pipe that meets the highest standards of the industry, better talk to Valley. New resistance welding and process control facilities assure you of the quality you demand. Ideal as line pipe for petroleum, gas, water, etc. Surface casing also available. Special wrappings and coatings.

Sizes: 6" 6⅝" 8" 8⅝" 10" 10¾" 12" 12¾" 14" 16" in wall thicknesses to .219.

Write or call Steel Pipe Division

VALLEY MANUFACTURING COMPANY
VALLEY, NEBRASKA



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MANUFACTURER'S REPRESENTATIVE FOR:

PITTSBURGH COKE & CHEMICAL CO.
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THE RUBEROID COMPANY
Pipe Line Felts • Rock Shield
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Distributor in the Southwest for:
FIELDJOINTER*
for land use
(Manufactured by American Coating Supply Co.)

MANUFACTURERS OF:
FORMULA 291
Skin Saver

*Fieldjointer Patent No. 2763047

"serving all pipelines"

S. D. DAY COMPANY
3115 BUFFALO DR., HOUSTON 19, TEXAS
PHONE JA 8-2431

Thornton Named Director Of Engineering and Research

Arthur W. Thornton has been appointed director of research and engineering for National Tube Division, U.S. Steel Corporation. He had been general superintendent of the Division's Lorain, Ohio Works. In the newly created job, he will be responsible for all engineering and research activities of the National Tube Division.

William L. Fader, who had been assistant general superintendent at Lorain, succeeds Thornton. Associated with the company since 1926, Thornton became general superintendent at Lorain in 1960.

MacNutt Industries Named Representative for ARCCO

ARCCO Instruments Company, Inc., has announced the appointment of MacNutt Industries Limited, Calgary, as the company's sales representative in British Columbia, Alberta and Saskatchewan. Charles A. S. MacNutt, president of MacNutt, served 18 years as western division sales manager for leading manufacturers. His firm will represent ARCCO in sales and service of the complete line of ARCCO instruments.

Crucible Appoints Buerger Assistant to Vice President

Josef H. Buerger, Jr., has been appointed assistant to the vice president - commercial at the Crucible Steel Company of America. He will assist in all administrative functions of the Commercial Department and have full responsibility for assigned new commercial studies.

Buerger formerly was vice president of marketing with Yuba Consolidated Industries in San Francisco. Previously he was sales manager of the U.S. Pipe and Foundry Co.

George E. Gunther Named Trojan Tractor Sales Manager

George E. Gunther has been named domestic sales manager for the Trojan tractor shovel line of the Yale & Towne Manufacturing Company. He comes to the company after 12 years of service with Thew Shovel Company where he advanced to sales manager-Western region.

He began his career with American Chain & Cable Co., Inc., in 1931.

CLASSIFIED ADVERTISING

STEEL PIPE
for
LINES
ROAD CROSSINGS
etc.

2" to 72" O.D.
T & C or B E, also special ends
Bare or Coated and Wrapped

Lowest delivered prices by car or by our fleet of trucks and trailers.

VALLEY STEEL PRODUCTS CO.
PRospect 3-3020
124 Sidney St. — St. Louis 4, Mo.

American Standard Acquires Rochester Manufacturing Company

American Radiator & Standard Sanitary Corporation has acquired Rochester Manufacturing Company, Inc. The Rochester company will be operated as a part of the Detroit Controls Division of American Standard. American Standard purchased the company in exchange for about 125,000 shares of common stock.

Graver Tank & Mfg. Co. Appoints Robert W. Johnson Vice President

Robert W. Johnson has been appointed vice president marketing and sales for Graver Tank & Mfg. Co., Division-Union Tank Car Company. Johnson had been associated with Dunbar Kapple, Inc., as vice president and general sales manager. Previously, he was a marketing associate for Booz, Allen & Hamilton, a national consulting firm.

Amot Controls Appoints Glidwell Chief Engineer

J. E. Glidwell has been appointed chief engineer of Amot Controls Corporation. Glidwell has long been associated with the engine industry as an officer in the Society of Automotive Engineers and formerly was vice president of engineering at Hall-Scott Motors. He will be headquartered in Richmond, Calif.

Barnum Named Assistant Manager For Kaiser Steel Corporation

William S. Barnum has been named assistant manager of tubular sales for Kaiser Steel Corporation, with headquarters in Oakland, Calif. Barnum, who formerly served as assistant manager of sheet and strip sales, succeeds Jack H. Webber. Webber recently was named manager of Mid-Continent sales district in Tulsa. Barnum joined the company in 1951.

Collins Radio Co. Constructing Manufacturing Building in Texas

Collins Radio Company has begun work on a $1.8 million manufacturing building on its 200-acre site at Richardson, Texas. It will contain 117,000 square feet of floor space and will be completed about August 15. It will handle manufacturing and assembly functions with supporting office space and cafeteria. It will be the second major building on the site, where Collins operates a research and development building.

General Electric Appoints Koeritz Manufacturing Manager

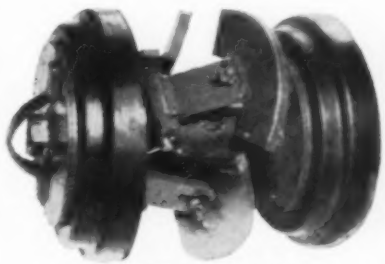
Dr. Erwin M. Koeritz has been named manager of manufacturing, Metallurgical Products Department of General Electric Company. Since 1956, he has been manager of manufacturing engineering in the firm's Silicone Products Department. From 1954 to 1956, he was supervisor of process engineering there. He joined the department in 1952.

Thermoid Names Campbell Manager Of Sales and Marketing Services

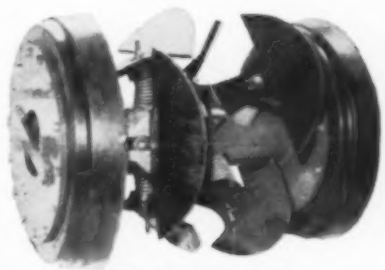
A. Campbell, Jr., has been appointed manager of sales and marketing services for the Thermoid Division of H. K. Porter Company, Inc. Campbell has been with the Thermoid Division for 23 years. Under his supervision will be the automotive and industrial product managers and their staff, customer service personnel and sales statistics and research department.

If you have a special problem...

we can help you!



TYPE HI—6" TO 18"



TYPE HI—20" TO 36"

TYPE HI—6" to 36"

The latest development in pipe cleaning tools.

CONSTRUCTION

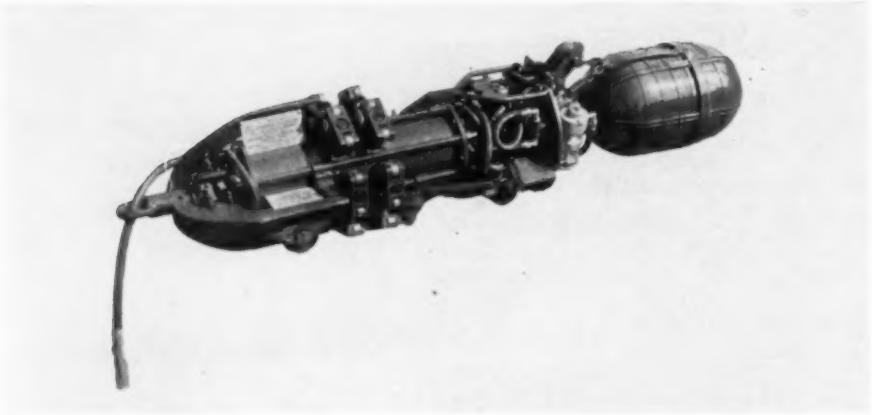
These springs extend through the center of the unit to blades on the opposite side of the unit which gives it a maximum of flexibility. The heavy springs on this unit help to keep it centered in the pipe supporting its own weight which will give far greater cup life.

DESIGN

This unit is ideal for first run on new construction, or for extremely corroded pipelines.

PIPELINE CLEANERS CO.
FORT MADISON, IOWA
PHONE DRake 2-2051

What's New in EQUIPMENT



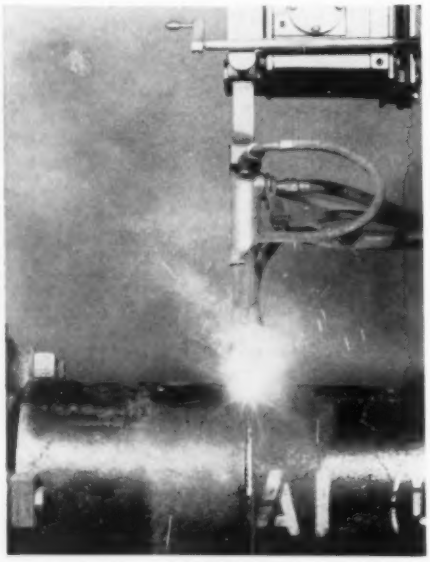
Line-Up Clamp

A pneumatic line-up clamp for small diameter pipe has been announced by Crutcher-Rolfs-Cummings. Pipe as small as 12 and 14 inches in diameter can be lined up with the new air clamp.

The unit measures only 58 inches long and weighs 215 pounds. With pneumatically controlled heads which operate independently, the clamp affords quick, positive line-up even on two joints of different thicknesses. Units also can handle pipe which has been shaped into maximum degree bend. Rollers roll pipe into an exact round without friction or sliding on pipe surface, minimizing damage to pipe. A 1,200 cubic inch air reserve tank permits several line-ups without refilling.

(This item supplements Crutcher-Rolfs-Cummings, Inc., data on pages 118-119 of the Pipe Line Catalog, Third Edition.)

For more data, circle **No. E1** on Readers' Service Card, last page this issue.



Double Jointing System

Hobart Brothers Co. announces a new Microwire welding system which employs carbon dioxide as the shielding gas, eliminates the need for a stringer bead and back-up ring.

The system includes a wire feeder coupled to a specially designed constant voltage motor generator welder. Filler wire is fed to a fixed welding torch for flat position or roll welding, or to a lightweight hand torch for semiautomatic applications. The water-cooled torch contains the current pick-up tube and electrode wire. It also directs the carbon dioxide shield into the welding zone, prohibiting atmospheric contamination of the weld.

The microwire uses a small wire from 0.200-inch to 0.045-inch electrode. An extremely low arc voltage, in the range of 16 to 20 volts and a low current from 30 to 150 amperes DC reverse polarity are employed.

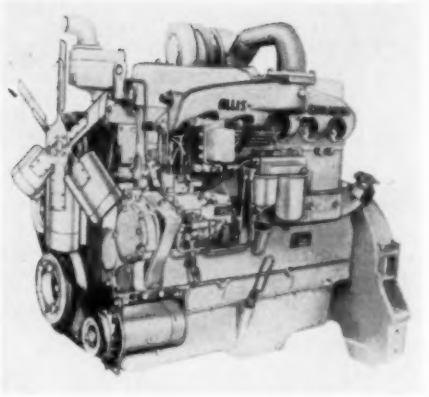
For more data, circle **No. E2** on Readers' Service Card, last page this issue.

Valve Actuator

A hydraulic valve actuator has been introduced by Oil-Dyne, Inc. The motor and pump run only for the few seconds required to open or close the valve, and the actuator provides an automatic locking feature that holds gate or plug in any desired position. Suitable for use on virtually any type or size of valve, the complete unit fits well within overall valve dimensions on most applications.

The automatic locking feature is controlled by an internally-mounted directional control valve, an integral part of the Oil-Dyne reversible pump. They can be set up for remote or direct control, permitting single location control of several valves located at different points. Actuators can be equipped with a hand pump for use in event of power failure.

For more data, circle **No. E3** on Readers' Service Card, last page this issue.



Diesel Engines

An expanded line of diesel engines with the addition of a 145 horsepower Model 10,000, and the 210 hp turbocharged 11,000 engine has been announced by Allis-Chalmers Manufacturing Company.

The engines are six cylinder and have 516 cubic inch piston displacement with 4 7/16-inch bore and 5 9/16-inch stroke. Both engines are available as either open or closed units; as off-highway engines; packaged torque converter units; for diesel electric sets, and for marine use. The 11,000 diesel for light duty marine applications has a 200 shaft hp rating at 2,200 rpm and the 10,000 diesel for the same purpose is rated at 145 shaft hp, also at 2,200 rpm. The electric set with the 10,000 engine provides up to 66 kw and the set using 11,000 engine up to 110 kw.

(This item supplements Allis-Chalmers Manufacturing Co. data on pages 37-40 of the Pipe Line Catalog, Third Edition.)

For more data, circle **No. E4** on Readers' Service Card, last page this issue.

Epoxy Adhesive

Humble Oil & Refining Company announces the Humble-Weld 900 epoxy adhesive which offers outstanding bonding characteristics when used on steel or nonferrous surfaces. It is used to repair steel storage tanks, and is especially effective in sealing weeping type steel rivit heads and tanks seams. Humble-Weld 900 may also be used for the repair of tank bottoms and other areas with patch plates.

Because it is ready for immediate use, maintenance crews can make repairs on the job. The result is minimum downtime, elimination of expensive equipment (even welding) and safer operations. It may be used on tanks, pipe lines, heaters, pressure vessels, for fabricating metals and a variety of uses in the marine industry, manufacturing plant and home workshop.

For more data, circle **No. E5** on Readers' Service Card, last page this issue.

Pipe Dope—Tape Form

A new pipe dope produced in tape form, Pipe-Pac, has been introduced by Johns-Manville Corporation. It is application for joining pipe, plastic, ceramics, etc., it will withstand temperatures from minus 300° F to plus 500° F. It can be used for pipe carrying air, oil, water, gas, steam, solvents and chemicals of all types, and corrosive materials. It is available in pocket-sized 24- and 48-inch rolls.

For more data, circle **No. E6** on Readers' Service Card, last page this issue.

PLICOFLEX LAMINATED PIPE PROTECTIVE TAPE

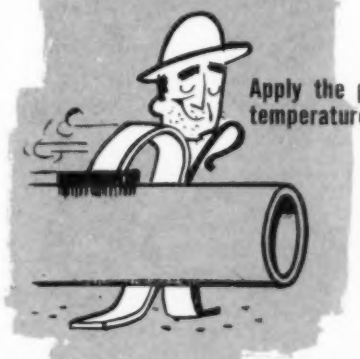
HELPED GET MIDWESTERN PIPELINE INTO GROUND IN A HURRY!

20,000 ft.-day average taping rate of progress with a record day of 28,000 feet on the Midwestern Gas Transmission Company pipeline is a fine example of the ease and speed with which Plicoflex laminated vinyl-butyl tape goes onto pipe to get it into the ground . . . fast.

Ease of pipe preparation and ease of tape application with a minimum of equipment as well as Plicoflex's proven pipe protection make it your best buy in protecting pipe, above or below ground.

Application is simple . . . all you need to do is

Give the pipe a good wire brushing



Apply the primer (at prevailing temperature)

Wrap the tape and ditch the pipe. All this in one operation!

Plicoflex protects your pipe because it's—moisture proof • nonconductive • impact resistant • bacteria proof • abrasion resistant • soil stress resistant • chemical resistant.

PLICOFLEX, INC.

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JAckson 6-3711 Teletype HO 277

10 colors, 4 thicknesses available. Write for descriptive literature or demonstration.

Better Filters

Caterpillar Tractor Co. announces a new lubrication oil filter element featuring a considerable increase in filtration efficiency without a loss in service life. The 7M 3800 paper element removes an even greater percentage of impurities than the 9F 6700 element and also retains the full service life of the earlier unit.

The filtering paper is considerably stronger, thicker and removes more contaminants from the oil than earlier materials. Deep grooving of the filtering paper maintains proper fold separation.

(This item supplements Caterpillar Tractor Co. data on pages 66-69 of the Pipe Line Catalog, Third Revision.)

For more data, circle **No. E7** on Readers' Service Card, last page this issue.

Crawler Tractor

A new 750 crawler tractor has been announced by J. I. Case Company. It features a 301 cubic inch Case diesel engine; is equipped with Terromatic transmission and a "load-sensing" torque converter that produces up to 23,000 pounds push pull effort. Split second power shifting, power steering and independent power control of each track are also featured.

The Case 750 also offers finger tip pressure hydraulic controls, self lubricating lower track rollers, ease accessibility to oil and fuel filters and the electrical system, plus the introduction of a new concept of servicing with simple hand tools.

For more data, circle **No. E8** on Readers' Service Card, last page this issue.

Dark Room

A portable dark room trailer has been developed by the Jem Penetrameter Mfg. Corp. The Jet Lab Junior is designed as a permanent or semi-permanent mobile dark room which can be set up at the jobsite. It is fully equipped with the processing and master tanks, ventilating fan, electrical outlets, etc.

The trailer is 11 feet long and 6 feet wide with a working area of 8 by 4 feet. It is of the standard box-type metal construction, equipped with ball joint coupler and jack stand.

For more data, circle **No. E9** on Readers' Service Card, last page this issue.

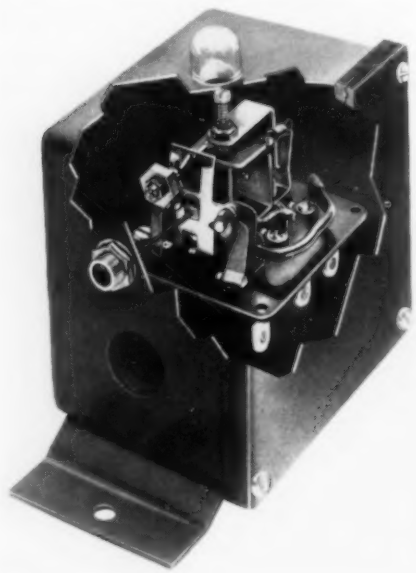
Gas Turbines

Three new Clark Bros. Co. gas turbines, Model 305, will be installed on Trans Canada Pipe Lines Limited gas pipe line. The two-shaft machines are rated at 8,730 hp each and will drive Clark 30 by 30 single stage centrifugal pipe line compressors. The compressor volute is furnished as an insert within the outer case so that the same machine can handle high head—low flow at initial conditions and later can be adapted for low head—high flow conditions with the insertion of new internal components.

The turbine driven compressors have been equipped with specially designed control systems that will be easily adapted to fully automatic, completely unattended station operation.

(This item supplements Clark Bros. Co. data on page 72 of the Pipe Line Catalog, Third Edition.)

For more data, circle **No. E10** on Readers' Service Card, last page this issue.



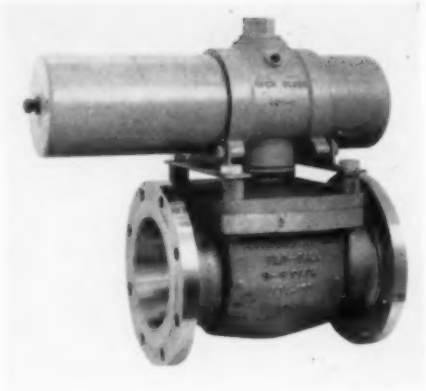
Safety Switch

A new safety switch designed to shut down any equipment subject to destructive vibration or shock has been developed by Frank W. Murphy Mfr., Inc. Sensitivity is easy to adjust with a screw driver while equipment is in operation.

The switch is sensitive to abnormal oscillation in two planes of motion and is recommended for use on engines, pumps, compressors and other equipment where vibration could be destructive. It can be wired to ground ignition, sound alarm, activate control panel lights, or operate valves such as diesel fuel shut-off valves or electric motor controller circuits.

(This item supplements Frank W. Murphy Mfr., Inc., data on pages 290-291 of the Pipe Line Catalog, Third Edition.)

For more data, circle **No. E11** on Readers' Service Card, last page this issue.



Flo-Ball Valve

An 8-inch, high capacity Flo-Ball valve with a spring return is available from Hydromatics, Inc. It is top loading for easy access to the internal assembly without removal from the line. It has a top and bottom guided ball and a floating seat. Designated Model 731 V, and rated at 150 pound ASA, it is equipped with a close coupled, compact air operated actuator with a manual override.

For more data, circle **No. E12** on Readers' Service Card, last page this issue.

Air Conditioning Units

A new line of packaged central air conditioning units, featuring "Better Air" filters, has been introduced by American Air Filter. A complete selection of both unit and automatic air filters is available as preselected and matched components of an air-conditioning unit.

Air filters available for the particular situation include AMERglas throwaway, HV2 permanent cleanable unit filters, and automatic filters such as the automatic renewable media Roll-O-Matic, and the Rollotron, a combination dry electrostatic with the automatic renewable media filter.

For more data, circle **No. E13** on Reader's Service Card, last page this issue.

Backhoe Attachment

Parsons Company announces a new 88C hydro-clam backhoe attachment for utility tractors for spot excavation. The clam bowl operates independently or together to produce smooth, clean sides and level floor. It is available with 24-, 30- and 36-inch wide buckets and features 10,000 pound breakout, 3,000-pound lift capacity, 12-foot digging depth and 9-foot, 9-inch dumping height.

For more data, circle **No. E14** on Readers' Service Card, last page this issue.

SOMASTIC®

Low-Cost Permanent Pipeline Protection

This is Somastic. It has high dielectric resistance and is moisture proof. It has tensile strength to meet severe soil stresses and depression forces. It has outstanding resistance to corrosive soils. Somastic is without question the finest pipeline protection available today.

Somastic provides lowest cost protection in both difficult and normal exposures because it gives virtually permanent protection.

Write for data giving complete facts on the advantages of Somastic.

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Subsidiary of American Pipe and Construction Co.

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Rail Address, Pacific Electric, Watson, California

For more data on advertised products, use Readers' Service Cards, last page.

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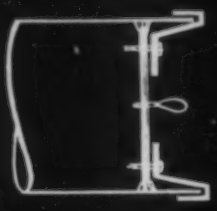
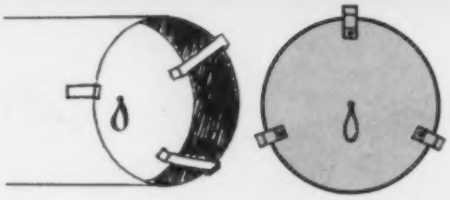


Save Money on Pipe plugs



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for "Nite-Caps"

Economical, expendable temporary pipeplugs. Effective barrier to animals, debris, moisture. Are used for pipe storage and pipe shipment, because "Nite-Caps" are cheap enough to throw away. Prices on request. **GREENHEAD, INC.**

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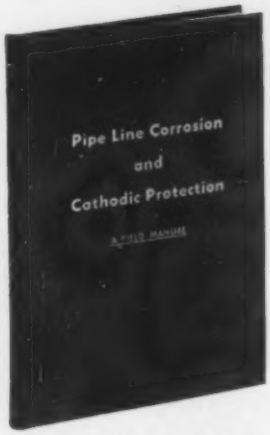

The most practical on-the-job manual for men concerned with pipe line corrosion.

Pipe Line Corrosion and Cathodic Protection

By MARSHALL E. PARKER

This book is designed as a practical field manual. It provides workable methods that can save you valuable time and effort in obtaining interpretive field data.

Contents (Condensed). Soil Resistivity Surveys, Pipe-to-Soil Potentials, Line Currents, Current Requirement Surveys, Rectifier System for Coated Lines, Ground Bed Design and Installation, Magnesium Anodes on Coated Lines, Hot Spot Detection, Stray Current Electrolysis, Interference in Cathodic Protection, Operation and Maintenance, Coating Inspection and Testing.

Appendices cover: Fundamentals of Underground Corrosion, Basic Principles of Cathodic Protection. Plus . . . tables and properties of metals, attenuation equations and index.

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Literature

For more data on New Equipment or copies of Catalogs and Literature reviewed in this issue, use the Reader Service postcards just inside the back cover and facing the Advertisers' Index. Simply circle code numbers of items desired—sign and mail card.

Protective Coatings

Koppers Company, Inc., has issued an 8-page bulletin on Bitumastic cold-applied protective coatings. In addition to covering the properties and specification data on nine major Bitumastic products, the brochure lists scores of typical installations requiring corrosion protection along with recommended Bitumastic coating.

To get a copy, circle **No. E15** on Readers' Service Card, last page this issue.

Wheel Loaders

An 8-page booklet on the research and development of its line of wheel loaders has been announced by Caterpillar Tractor Company. The booklet explains that the current line is a descendant of the cable Traxcavator of years ago. The development, step by step, is outlined in the brochure and the booklet is highly illustrated with working photographs.

To get a copy, circle **No. E16** on Readers' Service Card, last page this issue.

Gate Valve

Describing its new line of gate valves, the Ohio Injector Company has published a 12-page brochure. The brochure covers the Pipe-Pal series of ½ through 2-inch small gate valves and the Pipe-Mate series of 2- through 12-inch large gate valves. The folder describes many applications for Ductile Iron valves.

To get a copy, circle **No. E17** on Readers' Service Card, last page this issue.

Manual Loading Panels

A bulletin explaining manual loading panels for remote manual control of pneumatically-operated valves, cylinders and other devices has been issued by Mason-Neilan, Division of Worthington Corporation.

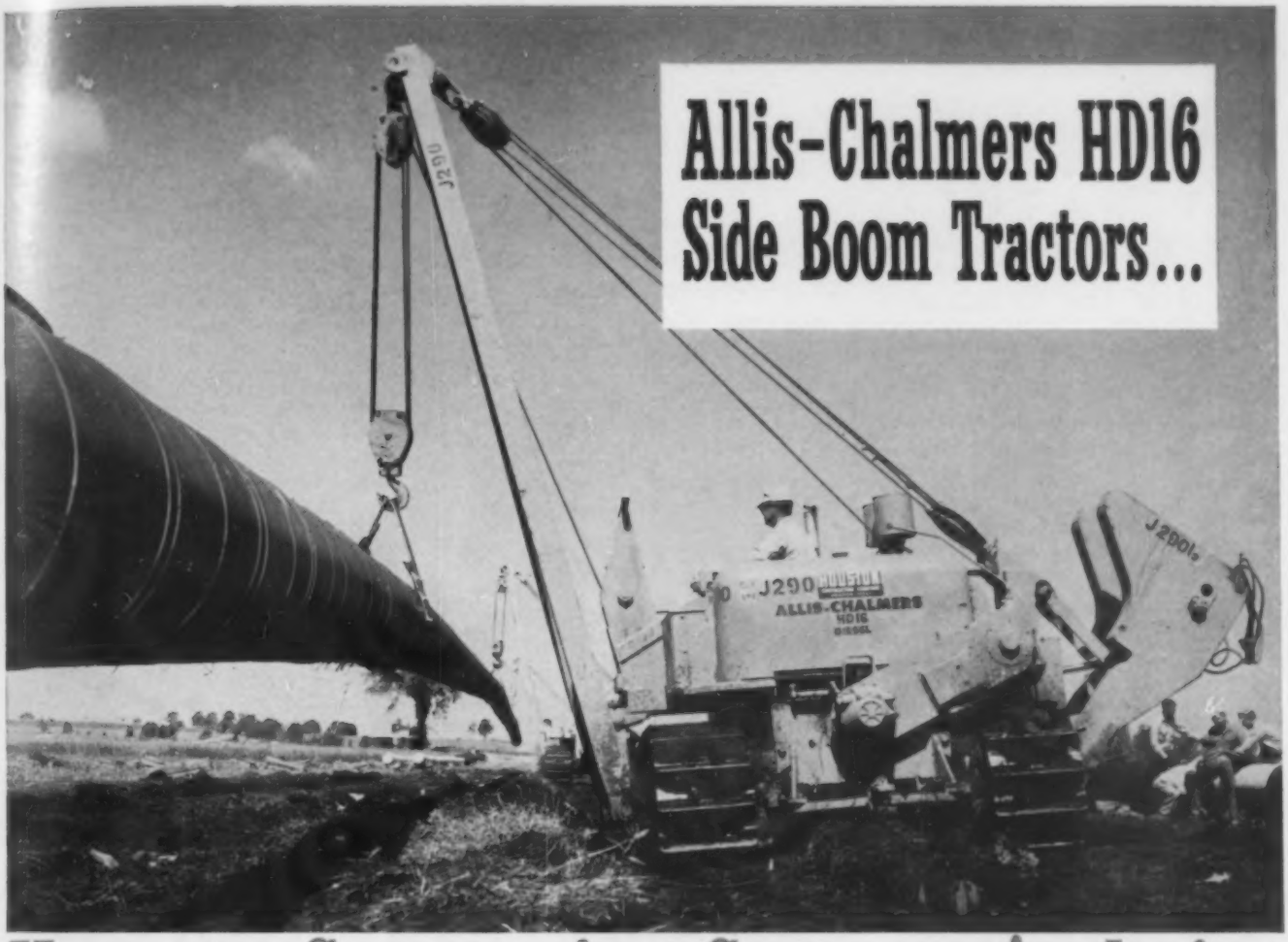
Specifications are given for two units—Model 140-1, for reduced pressure ranges of 0-40 or 0-100 psi; and Model 141-1, for installations requiring more precise regulation, with ranges from 0-30, 0-50 or 0-100 psi.

To get a copy, circle **No. E18** on Readers' Service Card, last page this issue.

Industrial Telemetering

Dresser Electronics, SIE Division, has published the first volume in a series devoted to a simplified explanation of Industrial Telemetering. Starting with the ABC's of land line codes, parity checks, weighted binary techniques—and other basics of the petroleum automation business—the series will continue through an entire exposition of supervisory control and telemetering.

To get a copy, circle **No. E19** on Readers' Service Card, last page this issue.



Houston Contracting Company's choice for 24" Michigan-Wisconsin Pipe Line

There's a good reason for one of the leading pipeline construction company's selecting Allis-Chalmers for their job. First of all, the powerful high-clearance HD-16 is the best balanced tractor on the market which means more efficient operation in hilly and boggy terrain. The famous Allis-Chalmers torque converter is standard equipment in the HD-16 FC Boom Tractor and this means easy operation. And when you're laying pipe in hilly and mountainous terrain the Allis-Chalmers HD-16 has plenty of power — not only to pick up a load but to carry it as well. Still another feature of the HD-16 is the Decelerator foot throttle which frees the operator's hands so he can handle the side boom. The HD-16 costs surprisingly little to operate. Its 150 net hp engine can save you up to 27% in fuel over other tractors of comparable size. Permanently lubricated rollers, heavy duty, extra tough tracks keep maintenance costs low on the HD-16.

Call Brown-Fogle and ask to have a demonstration of the HD-16 soon.

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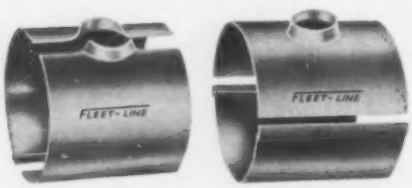
SADDLES: Conventional, and for pressure vessel heads. Nozzle sizes from ¼" to 24". Fleet-Line saddles weld neatly into place in much less time, and with much less welding rod.

Full encirclement saddles.



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Silicone Rubber

Stillman Rubber Company has announced a bulletin on their special silicone rubber formulations for seals and gaskets.

These silicone polymers, which are resistant to fuels and oils, are described as to applications and characteristics for sealing of difficult liquids.

For more data, circle **No. E20** on Readers' Service Card, last page this issue.

Over-Specialization?

A 12-page booklet titled "Half a Man Is Not Enough" is offered by Western Supply Company. The book discusses the problem of over-specialization by engineers with its resultant lack of development in the fields of human interests and understanding.

It points out that human interests must balance technical efficiency before an engineering specialist can really be on the road to success and happiness. The booklet contains a 14-point check list which may be used as the basis to develop a formula for well-rounded, successful living.

For more data, circle **No. E21** on Readers' Service Card, last page this issue.

Magnarator

A new through-flow pneumatic transmitting rotameter, The Magnarator, is described in a six-page catalog from Fischer & Porter Co. The catalog states that the mounting of the 3-15 psig transmitter alongside the metering tube eliminates both the need for an extension and any change in the direction of the fluid flow. It claims that range, accuracy, predictability, special materials, viscosity immunity and other characteristics of Fischer & Porter rotameters are retained.

For more data, circle **No. E22** on Readers' Service Card, last page this issue.

Packaged Compressors

Clark Bros. Co. has published Bulletin 189 on its high pressure packaged compressor systems. Features described and illustrated include balanced/opposed design to eliminate vibration; high performance compressor cylinders; crosshead type construction; adaptability to synthetic lubricants; unitized assembly complete with motor driver, intercoolers and all accessories.

For more data, circle **No. E23** on Readers' Service Card, last page this issue.

Centrifugal Pump

A 4-page brochure on its self-priming centrifugal pump for petroleum products handling has been published by Ingersoll-Rand Co.

The centri-prime motorpump combines a vane-type priming pump with a conventional high-efficiency centrifugal pump. The booklet presents sketches of pipe-pump-tank layouts showing unloading of a tank car; top unloading a transport; pumping from underground storage; and combination loading, unloading, and transfer.

For more data, circle **No. E24** on Readers' Service Card, last page this issue.

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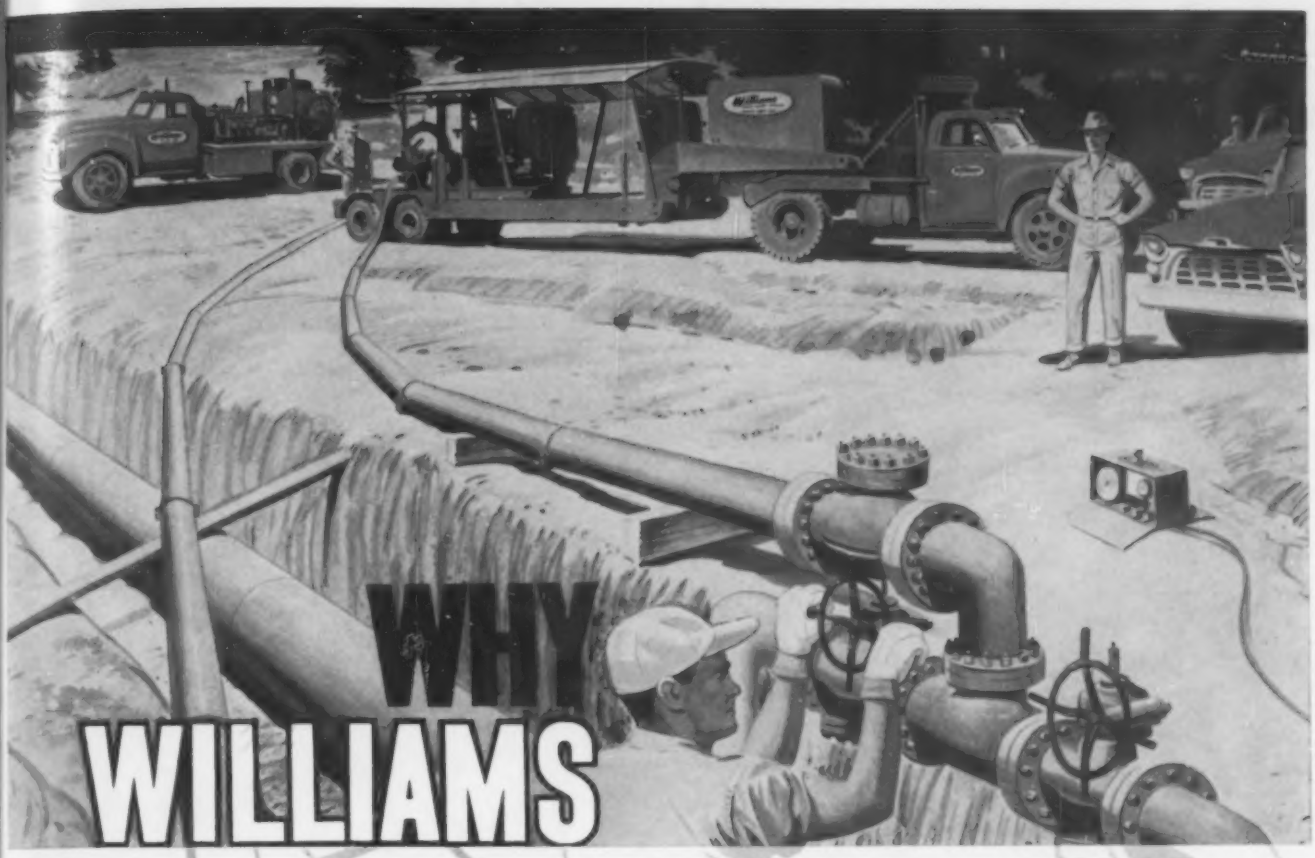

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Only Onan is certified to give you all the power promised by its nameplate

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